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ABSTRACT

This manual is the result of a curriculum development project undertaken by the North Carolina Department of Community Colleges to align vocational curricula with valid, on-the-job performance requirements. Its four chapters present a competency-based curriculum designed to prepare individuals for careers in recreational grounds management. Chapter I describes curriculum objectives and then briefly discusses faculty selection and certification; requirements in the areas of facilities, equipment, and instructional materials; library support; and liaison activities with professional organizations in the grounds management industry. Chapter II details activities undertaken by an advisory committee during the curriculum development project, including: an examination of curriculum materials available in the area of grounds management; a statewide survey of golf course managers to assess career opportunities; the identification of tasks performed in each occupation; and an analysis of each task to specify requisite competencies. Job descriptions and associated tasks for nine entry- and advanced-level grounds maintenance occupations are outlined in Chapter III, while Chapter IV suggests a sequence of courses leading to the Associate Degree. Brief descriptions are provided of each course. The manual's appendices report survey results and enumerate the competencies associated with identified grounds management tasks.

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RECREATIONAL GROUNDS MANAGEMENT TECHNOLOGY
A COMPETENCY-BASED CURRICULUM MANUAL

September, 1980

Coordinated by
Coy L. Hudson

Department of Community Colleges

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FOREWORD

Recreational Grounds Management Technology - A Competency-Based Curriculum Manual was designed utilizing a competency-based curriculum model to determine specific employment requirements of graduates entering the recreational grounds management industry. The Department of Community Colleges encourages institutions to continually review and update curriculums designed to prepare students for employment. The Recreational Grounds Management Curriculum Manual represents an effort coordinated by the Department to update the Recreational Grounds Management curriculum using performance competencies as a basis for determining curriculum content and objectives. The materials contained in this manual were developed, reviewed, and approved by the recreational grounds management instructors in the North Carolina Community College System and employers and employees of the golf course industry in the State.

The curriculum manual should be used by institutions in the North Carolina Community College System to update their current Recreational Grounds Management curriculums and by institutions planning to offer new Recreational Grounds Management curriculums. Following the guidelines in this manual with the assistance of a local advisory committee, institutions should be able to offer effective programs that meet industry needs. Staff of the Occupational Program Services Section and the Recreational Grounds Management Competency Committee recommend the materials contained in this manual to you.

ACKNOWLEDGEMENTS

Appreciation is extended to the individuals who contributed to the development of this manual. This publication would not have been possible without their assistance and cooperation.

Special acknowledgement goes to three recreational grounds management instructors who developed all of the curriculum materials contained in the manual--Harry DuBose, Catawba Valley Technical College; Charles Tomlinson, Catawba Valley Technical College; and Ed Duren, Wayne Community College. Without the interest, support, and dedicated efforts of these three individuals, this publication would not have been completed.

Appreciation is expressed to the owners, employers, and employees of the various golf courses in North Carolina who responded to the job and task surveys for the validation of the materials. Their response adds credibility to the publication and their efforts are certainly appreciated.

Special thanks and recognition is given to Mrs. Laurel Pearce, Secretary for the Project Coordinator, for coordinating all correspondence concerning the manual, for typing the manuscript, and for providing assistance in decision making and other matters.

To William F. Pugh, Artist Illustrator, Department of Community Colleges, appreciation is expressed for developing the cover design for the manual.

Finally, special acknowledgement is extended to Mr. Roger Worthington who provided encouragement and many helpful suggestions during the entire project.

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CHAPTER I

INTRODUCTION

The Recreational Grounds Management Technology curriculum has been offered in the North Carolina Community College System since 1967. The need for technicians trained in the development and maintenance of golf courses, parks, and other recreational grounds areas reflects the demand for increased recreational facilities by the citizens of North Carolina. Individuals have more time for leisure activities and more and more citizens are taking advantage of the recreational facilities available to them. In addition, a significantly greater number of men, women, and children are using golf courses, parks and other recreational grounds areas to assist them in establishing and maintaining good health.

Good management of recreational grounds has become a prerequisite for the success of these establishments. Individuals have become more conscious of the environment and expect public and private facilities to be esthetically pleasing. A well designed and maintained golf course, a park that is very attractive with well manicured grass, trees, flowers, and natural areas, or an arboretum or garden that is beautifully landscaped and maintained add immeasurably to the well being of peoples' lives. In recent years, increased awareness has been given to the value of such developments. As a result, the Recreational Grounds Management curriculum was chosen to be included as one of the first curriculums to be upgraded by using the competency-based curriculum approach. Therefore, the materials contained in this manual supersede all previous materials published by the Department of Community Colleges concerning Recreational Grounds Management Technology.

Curriculum Implementation

This manual is available to aid institutions wishing to update the Recreational Grounds Management Technology curriculum as well as for the institution initiating a new curriculum. Items provided in the manual include a suggested curriculum by quarters, course descriptions, entry level and advanced level job opportunities, tasks listed by specific jobs, competencies, and criterion measures. In addition, the manual includes a suggested equipment list to serve as a guide to institutions for purchasing needed equipment. All information should be used by institutions to assist in focusing the instructional activities of the curriculum and in determining competencies of students, both graduates and early leavers.

Curriculum Design

The Recreational Grounds Management Technology curriculum is designed as an associate degree program with emphasis on the development of specific skills, knowledge, and attitudes needed to be successful in the various jobs for which individuals are being prepared. Content has been arranged to provide for the development of increasing levels of skills and knowledge as the student progresses in the program. One quarter of cooperative work experience is also included in the curriculum to assist the student to become as familiar as possible with actual job tasks.

General education and related courses have also been included in the curriculum to support the knowledge and skills required by the various jobs. General education courses include communication skills and social science. Related courses include mathematics, agricultural chemicals, soils and fertilizers, plant science, and soil and water conservation.

Entry level and advanced level jobs have been validated by surveying employers and employees. Job descriptions have also been provided as well as the tasks that are performed by individuals employed in the jobs. Job descriptions and tasks can be used to describe the educational experiences recommended for students prior to completion of the curriculum. It is recommended that these statements be reviewed and refined by the local advisory committee to assist the institution in meeting local manpower needs. Further assistance might be provided by the local advisory committee in reviewing tasks, competencies, and instructional objectives to determine if all identified tasks should be taught as described.

Faculty and Staff Selection and Certification

The effectiveness of any educational program depends to a large extent on competent, well qualified, highly motivated instructors who have a desire to teach. This is especially true in the community colleges, technical colleges, and technical institutes because of the large numbers of low ability, disadvantaged students who attend these institutions. It is necessary for faculty and staff to understand the unique nature and role of the comprehensive institution.

Formal certification of faculty members by the Department of Community Colleges is not required. However, the North Carolina Administrative Code; Title 16, Department of Public Education; Chapter 4; Department of Community Colleges; Subchapter 4C, Section .0202 indicates that:

- (1)
- (2) Institutions shall employ faculty members so as to meet Southern Association of Colleges and Schools standards, and the State Board of Education's Standards and Evaluative Criteria, as amended.

- (3) Institutions shall determine appropriate teaching and non-teaching loads for faculty and for technical assistants to the faculty so as to meet Southern Association of Colleges and Schools standards and the State Board of Education's Standards and Evaluative Criteria, as amended.

Instructors of the Recreational Grounds Management Technology program should be able to carry out the objectives of the program and to plan, implement, and evaluate learning experiences essential to the program. Instructors should be well informed of the requirements for employee competency in jobs for which students are being trained so instructors can utilize resource people, field examples, and illustrations as supporting materials in their courses. Faculty members should also be able to counsel students, work with individuals and organizations within the community and, through research, continuing education, and/or professional organizations be aware of the changes developing in the recreational grounds management industry.

As indicated above, teaching loads of faculty should adhere to the standards of the Southern Association of Colleges and Schools and the State Board of Education's Standards and Evaluative Criteria. However, factors to consider in determining teaching and non-teaching work loads for Recreational Grounds Management Technology instructors include: (1) teaching loads of other instructors in other curriculum areas in the institution, (2) class contact hours, (3) number of preparations, (4) student loads, (5) committee assignments, (6) departmental responsibilities, and (7) other special duties. A full-time load is usually considered to be from 12 to 25 contact hours per week.

It is essential that Recreational Grounds Management Technology instructors have a knowledge of community development, know how to work and get along with citizens in the community, and be able to form and coordinate a local advisory committee made up of representatives of the recreational grounds management industry in the community and/or region. Much contact is required of instructors with employers, employees, and other individuals if a quality program is to be offered.

Facilities, Equipment, and Instructional Aids

Facilities

Adequate instructional facilities consisting of classrooms, laboratories, storage facilities, and outdoor laboratories are necessary for community colleges, technical colleges, and technical institutes to provide a quality program for Recreational Grounds Management Technology.

Classrooms are needed to provide the lecture and discussion part of courses. The number and size of classrooms will depend on student enrollment, curriculum design, methods and media used in instruction, and whether the classrooms will be used by students in other programs. Classrooms

should be attractive, clean, and well lighted, ventilated, heated, air conditioned, and acoustic-proof. Chalkboards, electrical outlets, and means of darkening the room for audiovisual presentations should be conveniently provided.

Laboratories should be conveniently located to classrooms in order to carry out experiments and to practice skills needed by the prospective graduate. Many of the contact hours required in the curriculum are devoted to laboratory demonstrations by instructors and manipulative skills development by students. Laboratories should be well equipped with cabinets, work stations, hot and cold water, gas, electrical outlets, and emergency showers and other safety equipment. A storage room should be located adjacent to each laboratory for equipment storage. All safety rules and regulations must be followed for storing chemicals and other hazardous materials.

For the Recreational Grounds Management curriculum, a greenhouse is not absolutely necessary but would be an added dimension to the program. A greenhouse could provide students with practical experience in propagating and growing plants. If available, it should be equipped with, fans, heaters, and automatic misting devices. The type and size of greenhouse would depend on the number of students enrolled in the program, the number of students in related curriculums using the greenhouse, the type of greenhouses used in the local area or region, and maintenance requirements.

A headhouse would also be a good investment for an institution offering this curriculum, especially if a greenhouse is provided. The headhouse should be located very conveniently to the greenhouse and should provide storage for media, soil supplements or amendments, and perhaps some tools and equipment. This facility should be large enough to provide plenty of room for mixing of media, putting media in cans, and preparing plants for propagation. Storage bins, cabinets, work stations, and areas should be included.

A lathhouse could also be an important facility for the program. Although it is not absolutely a necessity, a lathhouse using poles and snow fencing makes an ideal facility for placing plants after they come out of the greenhouse to protect them from the sun in summer and cold temperatures in winter. Watering can be done by hand, but it is much more practical and convenient to use automatic sprinklers.

A storage facility is needed to house the many tools and specialized equipment needed for this program. This facility should have a large door to allow equipment to be driven inside. Tools should be placed on the walls for ease in locating. It is necessary to secure the building at all times to reduce the risk of theft.

Land that can be used for outdoor laboratories to grow nursery stock, to experiment with chemicals, to grow various types of turf grasses, to develop putting greens, to plan and set up drainage and irrigation systems, etc., is a necessary investment for institutions offering Recreational Grounds Management Technology programs. Practical experiences are essential to students so that they will be competent to perform the skills required when they begin employment.

Equipment

Much specialized equipment is needed for the Recreational Grounds Management Technology program. Students should become knowledgeable about the use and care of the equipment. Instructors must keep a current inventory of equipment and immediately report any stolen or missing items. Also, as new equipment is developed, efforts should be made to acquaint students with the new equipment and purchases should be made when justified.

A suggested list of equipment needed for the program is included in Appendix E.

Textbooks, References, and Visual Aids

Appropriate textbooks, references, and visual aids are very important for teaching any subject area to insure that current information is presented and that materials are selected that best meet the particular needs of the student. Textbooks, references, and visual aids must be reviewed constantly and updated or supplemented based on new knowledge in the field and the results of research in teaching methods and developing concepts.

The Library

The library is an important source of reference materials for students to use in obtaining additional information on particular subjects assigned by instructors or for students to investigate interest areas on their own. The library should contain up-to-date books, periodicals, and other reference materials related to the Recreational Grounds Management Technology program as well as other programs. Recreational Grounds Management Technology instructors and students should be involved in selecting materials for the library and/or approving reference materials for recreational grounds management and related courses.

Characteristics of a quality library include qualifications of the librarian and library assistants; the facilities; the number and type of periodicals, books, and other reference materials; and the staffing and organizational structure. Library facilities should be readily accessible to both full-time and part-time students and faculty not only during instructional hours but during other hours convenient to both students and faculty.

Instructors should plan their instructional process to include students using the library to develop the habit of using it as a learning tool and to help foster a professional attitude which regards libraries as a resource for research endeavors and as good sources of information.

Professional Boards and Associations

It is important that recreational grounds management instructors and students be aware of professional boards and associations in the field of recreational grounds management. Instructors should work closely with these boards and associations because they can offer many benefits to their program. Some of the benefits include books, references, and other publications; new concepts, processes, techniques, and equipment available in the recreational grounds management field; provide support in investigating the need for a program, in promoting the program, in providing work experience for students, and in placement of graduates; supply resource people to speak to classes; and to host student groups on field trips or for individual student projects.

Early in their studies, students should become aware of the various boards and associations and the services and resources they offer. By becoming acquainted with them and by becoming active or ad hoc members if possible, students can learn quickly of developments in the recreational grounds management industry and become acquainted with persons in the community, region, and state who are active in the field.

Some of the boards and associations include:

- . Carolinas Golf Course Superintendents Association
- . Coastal Turf Grass Association
- . Mountain Turf Grass Association
- . North Carolina Association of Landscape Maintenance Contractors
- . North Carolina Association of Nurserymen
- . North Carolina Cemetery Association
- . North Carolina Irrigation Association
- . North-South Turf Grass Association
- . Piedmont Turf Grass Association
- . Turf Grass Council of North Carolina

CHAPTER II

Competency-Based Curriculum Development Project

The primary objective of vocational/technical education programs is to prepare individuals for employment in the occupations for which the programs are designed and developed. This education should be consistent with the ability, desire, and needs of the student; maintaining quality standards that are consistent with employment requirements.

Since the development of the Community College System, continuous concern and effort have been given to insuring the quality of programs, providing program guidelines, evaluating programs, improving the articulation process, and working with students, employers, and educators to determine student, business, industry, government, and service needs.

To further the development of quality vocational programs and articulation efforts between programs in the secondary schools and the community colleges, technical colleges, and technical institutes, the North Carolina Advisory Council on Vocational Education in its 1975 Annual Report recommended the following:

That the State Board of Education require that all vocational curricula designed to produce job entry skills be based on performance objectives validated by recent job analysis and task analysis and that parallel performance standards be established for completion of secondary and postsecondary programs, and that the State Board of Education immediately consider the most efficient, expedient method for attaining such a goal.

To begin implementation of the Advisory Council's recommendation and to continue and improve the development of quality vocational and technical curriculums, the Occupational Program Services Staff of the Department of Community Colleges in 1976 designed a competency-based curriculum project to develop competencies for the vocational and technical curriculums offered in the System. The project was developed to help alleviate the following continuing concerns about vocational/technical education:

1. A quality of instruction which makes it possible for individuals completing a curriculum or phase of a curriculum to be prepared for employment;
2. Articulation between secondary and postsecondary vocational/technical curriculums;
3. Involvement of employers, employees, and educators in curriculum development;

4. Assurance that curriculums are up to date in accordance with current job technology requirements.

Purpose of Project

The purposes of the project are: (1) to describe the desired outcomes of occupational programs, (2) to provide guidance for increased consistency among programs, and (3) to provide mechanisms for improved articulation with secondary and postsecondary occupational programs.

In response to the concerns regarding vocational/technical education, the project is designed to provide: (1) a validated list of career opportunities for which each curriculum provides training and education; (2) the tasks performed by employees in each job; (3) a list of competencies and evaluative criteria essential to successfully perform in the job; (4) curriculum guidelines; and (5) curriculum materials based on the competencies.

Specifically, the project:

1. Identifies each curriculum to be analyzed.
2. Identifies resources for curriculum development.
3. Identifies career opportunities for each curriculum.
4. Identifies tasks performed in the job.
5. Identifies competency and level of competency for each task.
5. Provides evaluative criteria for each competency.
7. Provides information for development and/or revision of curriculum guidelines and materials for career mobility at the secondary and postsecondary levels of instruction.

Organization of Advisory Committees

Each phase of this project is designed to assure maximum involvement of instructors, employers, and employees. In order to assure involvement, the procedural plan for the development of the competency-based project called for the development of two committees to assist in developing each curriculum--a working committee and a curriculum committee.

The working committee was made up of recreational grounds management instructors. The Presidents of the various institutions that offer Recreational Grounds Management programs nominated instructors to serve on

this committee. This working committee was responsible for assisting in the analysis, development, and validation of the total project. Specific duties of the committee members were to assist in identifying, listing, and validating career opportunities, job analyses, task analyses, competencies, and in writing curriculum guidelines and revising curriculum materials. The members of the working committee are listed in Appendix A.

The curriculum committee for this project was the working committee plus the golf course owners, managers, superintendents, and workers who responded to the job opportunities survey and task listing. The curriculum advisory committee for the Recreational Grounds Management program at Catawba Valley Technical College also responded to the task listing.

Methodology

The procedure used in conducting the competency-based project for the Recreational Grounds Management Technology curriculum included: (1) appointing a working committee; (2) initiating a resource search; (3) determining career opportunities available and validation of these careers; (4) listing and validating tasks; (5) writing competency statements and criterion measures for the tasks; and (6) developing a suggested curriculum and limited curriculum materials. The results of the project are presented in this manual.

Organization of Working Committee

Since there are only two Recreational Grounds Management curriculums currently being offered in the Community College System, the administrations of these two institutions were contacted to determine if their recreational grounds management instructors could assist in developing the project. With permission granted, the working committee consisted of three instructors. They were responsible for assisting in the analysis, development, and validation of the total project. Specific duties of the committee members were to assist in identifying, listing, and validating career opportunities, task analyses, competencies, and developing the suggested curriculum and limited curriculum materials.

Resource Search

A resource search was conducted to locate curriculum materials available in Recreational Grounds Management Technology. The search included sources such as ERIC, Abstracts of Instructional Materials in Vocational and Technical Education (AIM), Abstracts of Research and Related Materials in Vocational and Technical Education (ARM), Current Indexes to Journals in Education (CIJE), and Research in Education (RIE). Some of these sources provided good materials on tasks required of individuals employed in particular jobs. However, no task analyses were found.

Career Opportunity Survey

Curriculum guides and manuals used in the Community College System identify career opportunities available in the various curriculum programs. These publications as well as others were reviewed to determine the careers available to students enrolled in Recreational Grounds Management Technology. These identified careers were then compared with job titles contained in the publications Dictionary of Occupational Titles, Vocational Education and Occupations, and Occupational Outlook Handbook.

The career opportunities identified were listed and validated by a mail survey of a random sample of golf course managers/superintendents in North Carolina. Employers and employees were asked to respond to the survey form.

A total of 150 career opportunity forms were mailed and 80 were returned for a 53% response. The career opportunity survey form and a summary of the validation data is included in Appendices B-1, B-2, and B-3.

Task Listing and Validation

After the jobs were identified and validated, tasks were listed for the various jobs by the working committee using the resource materials. The tasks were then categorized under major subject topics. This task listing was then reviewed by Catawba Valley Technical Institute's Recreational Grounds Management curriculum local advisory committee. After this committee's review, the tasks were mailed to a random sample of managers/superintendents of golf courses and clubs in North Carolina. Of 150 task listings mailed, 72 were returned for a 48% response.

The task listing and task validation results are found in Appendices C-1, C-2, and C-3.

Task Analyses

The working committee examined each task after validation and wrote competency statements and criterion measures for each task. Competencies were written to indicate specifically what the student is expected to be able to do. Evaluative criteria were written to indicate the desired performance level of students for each competency. The competencies and criterion measures are provided in Appendix D.

Curriculum Materials

The curriculum guide contains a suggested schedule of courses by quarters, lecture, laboratory, clinical/shop, and quarter hours credit for each course, course descriptions, and a curriculum description. The courses included in the guide were determined from the list of tasks. These curriculum materials should be used by institutions to provide a framework for their recreation grounds management program and instructional content.

CHAPTER III

JOB DESCRIPTIONS/JOB COMPETENCIES

Job opportunities for the Recreational Grounds Management Technology curriculum were identified by examining various publications and then validated by surveying a random sample of employers who work at the various golf clubs in North Carolina. A list of the validated entry level and advanced level jobs for Recreational Grounds Management Technology is given below.

Suggested job descriptions and job tasks have been identified for each career opportunity. This information may be used to assist instructors in describing the types of educational experiences recommended for students. It is recommended that these job descriptions and task statements be reviewed by local advisory committees and used to assist the institution in meeting local manpower needs.

Recreational Grounds Management Technology Job Opportunities

(Validated by Survey)

<u>Category</u>	<u>D.O.T. Number</u>	<u>Job Title</u>
Entry Level	406.137-010	Assistant Superintendent, Golf Course
	406.683-010	Greenskeeper
	406.684-014	Groundskeeper, Industrial- Commercial
	406.687-010	Groundskeeper, Parks and Grounds
	408.684-010	Lawn-Service Worker
	625.281-034	Mechanic, Grounds Equipment
Advanced Level	187.167-114	Manager, Golf Course
	406.137-014	Superintendent, Golf Course
	406.134-014	Supervisor, Park Workers

Job Description

Supervises and coordinates activities of workers engaged in preserving grounds and turf of golf course in playing conditions. Confers with Superintendent, Golf Course (amusement and recreation) to plan and review work projects. Determines work priority and assigns workers to specific tasks, such as fertilizing, irrigating, seeding, mowing, raking, and spraying. Mixes and prepares recommended spray and dust solutions. May direct and assist workers engaged in maintenance and repair of mechanical equipment. May assist workers to perform more critical duties.

Tasks

The following tasks may be performed: (In addition to tasks performed by Greenskeeper)

11. Identify selected species of plants by common and scientific name (grasses, ornamentals, perennials, trees, etc.).
12. Use resource material to identify unknown plants which cannot be identified by visual inspection.
13. Have knowledge of cultural requirements of plants (light, soil, temperature, shade, etc.).
21. Interpret physical and chemical analysis of soils and make recommendations.
23. Calibrate spreaders and compute total amount of lime and/or fertilizer required in seedbed preparation.
24. Select and determine amount of seed, sprigs, or sod required in establishment.
25. Select and determine amount of mulch material required.
32. Select planting dates.
43. Develop and prescribe mowing patterns, height of cut, type of mower, and frequency of mowing.
62. Identify insects, diseases, and weeds which commonly infest turf areas.
63. Use professional or governmental agencies to identify unusual pests and make recommendations.
66. Select and mix insecticides, fungicides, and herbicides for prevention or control.
68. Take nematode assays.
72. Take soil test and interpret results.
87. Dig out sand traps, install drainage, and select and add sand.
89. Identify pests, diseases, and weeds.
90. Select and apply proper preventive or curative measures for pests, diseases, and weeds.
96. Develop and prescribe mowing patterns, height of cut, type of mower, and frequency of mowing.
105. Repair irrigation and drainage systems.
111. Take nematode assay.
138. Rope off and direct traffic.

153. Set mowing heights and adjust reels to bedknife.
168. Keep employee time records.
169. Keep records of receipts and expenses.
170. Keep records of fertilizers, lime, and pesticides applied.
171. Keep records of gasoline usage.
172. Keep daily and yearly rainfall and weather records.
177. File records and other materials.
179. Keep maintenance and repair records on equipment.
180. Keep current inventory of supplies, repair parts, oil and grease, seed, fertilizers, lime, pesticides, etc.
181. Check received merchandise against invoice listings.
183. Check invoices for math errors.
184. Store received merchandise.
189. Understand and comply with OSHA and EPA regulations.
190. Identify labor needs.
192. Designate and prepare work schedules for employees.
193. Train new employees.
194. Supervise employees.
195. Evaluate employee performance.
196. Recommend personnel actions such as promoting, firing, disciplinary action.
197. Identify equipment and supply needs.
200. Enforce safety regulations.
207. Keep golfers informed of problems, changes, and/or additions to course.
208. Have a good knowledge of playing golf.
211. Be aware of how and where to find current information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.
212. Have knowledge of and subscribe to various professional and trade publications.

Greenskeeper

Job Description

Performs any combination of the following duties: maintains grounds and turf of golf course in playing condition; operates tractor, using specific attachments, to till, cultivate, and grade new turf areas; applies prescribed amounts of lime, fertilizer, insecticide, and fungicide; mows rough and fairway areas at designated cut, exercising care not to injure turf or shrubs. Cuts turf on green and tee areas, using hand mower and power mower. Connects hose and sprinkler systems at designated points on course to irrigate turf. Digs and rakes ground to prepare new greens, grades and cleans traps, and repairs roadbeds, using shovels, rakes, spades, and other tools. May plant, trim, and spray trees and shrubs.

Tasks

The following tasks may be performed:

20. Take soil samples for physical and chemical analysis.
22. Mix and transport media.
26. Remove trees and debris.
27. Plow, disk, and rake area.
29. Install irrigation system.
33. Level and sterilize seedbed.
34. Apply fertilizer and lime.
35. Mix seed.
36. Sow seed, sprig, stolonize, plug, or sod.
37. Roll after planting.
38. Apply mulching materials.
39. Irrigate new plantings.
40. Fertilize new plantings.
41. Mow new plantings.
42. Mix and apply pesticides to new plantings.
44. Mow greens, collars, aprons, and tees.
46. Calibrate spreaders and keep records of settings.
48. Irrigate turf.
49. Relocate and replace cups.
50. Relocate and replace tee markers.
51. Repair divots.
53. Apply fertilizer and lime according to soil test results.
54. Aerify, slice, and spike turf.
55. Remove plugs.
56. Verticut and remove verticut debris from turf.
57. Sterilize topdressing material.
58. Mix and apply topdressing material.
59. Distribute topdressing with dragmat.
60. Overseed and reseed turf.
61. Report pest problems.
64. Obtain, package, and mail samples of pests to be identified.
65. Obtain a commercial pesticide applicators license.
67. Calibrate sprayers and apply pesticides, herbicides, etc.
77. Remove trees and debris.
78. Plow, disk, rake, or otherwise prepare land.
79. Apply fertilizer, lime, and/or other soil amendments.
80. Lay out irrigation system for fairways.
83. Level and smooth land preparatory to planting.
84. Stabilize steep banks.
88. Seed or sprig fairways and roughs at proper time.
91. Plant and/or transplant trees and shrubs.
92. Irrigate newly planted turf, trees, and shrubs.
93. Fertilize newly planted turf, trees, and shrubs.
94. Mow newly planted turf grasses.
97. Mow fairways and roughs.
99. Calibrate spreaders and keep records of settings.
100. Apply fertilizer and lime according to soil test results.
102. Irrigate established fairways.

- 104. Re-establish turf by seeding, sprigging, or sodding.
- 106. Repair worn areas.
- 107. Mix and apply proper pesticides and herbicides to control or prevent insects, diseases, and weeds.
- 108. Rake sand traps.
- 109. Add sand to traps.
- 112. Overseed fairways.
- 124. Plant trees and shrubs around clubhouse, entrance, and other prescribed areas.
- 128. Mow and edge lake banks and water hazards.
- 134. Repair cart paths.
- 139. Stake and/or provide protection for injured trees, newly transplanted trees, etc.
- 140. Install edging material.
- 148. Keep work and storage areas neat and clean.
- 149. Clean hand tools and equipment.
- 150. Sharpen hand tools.
- 151. Grind and sharpen mower blades.
- 155. Change and set nozzles on spray equipment.
- 156. Check and change oil in motors on power-driven turf equipment.
- 158. Grease power-driven turf equipment.
- 159. Check and change air filters in power-driven turf equipment.
- 160. Check tires and tire pressure.
- 161. Check, refill, and charge batteries.
- 167. Maintain, clean, and repair, when appropriate, signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets.
- 208. Have a good knowledge of playing golf.
- 210. Be familiar with various professional and trade associations and make decision about membership in these organizations.

Groundskeeper, Industrial-Commercial

Job Description

Maintains grounds of industrial, commercial, or public property, performing combination of following tasks. Cuts lawns, using hand mower or power mower. Trims and edges around walks, flower beds, and walls, using clippers and edging tools. Prunes shrubs and trees to shape and improve growth, using shears. Sprays lawn, shrubs, and trees with fertilizer or insecticide. Rakes and burns leaves and cleans or sweeps up litter, using spiked stick or broom. Shovels snow from walks and drive-ways. Spreads salt on public passage ways. Plants grass, flowers, trees, and shrubs. Waters lawn and shrubs during dry periods, using hose or by activating fixed or portable sprinkler system. Repairs fences, gates, walls, and walks, using carpentry and masonry tools. Paints fences and outbuildings. Cleans out drainage ditches and culverts, using shovel and rake. Depending on size and nature of employing establishment, uses tractor equipped with attachments, such as mowers, lime- or fertilizer-

spreaders, and lawn roller. May perform variety of laboring duties, common to type of employing establishment, when yard work is completed.

Tasks

The following tasks may be performed:

121. Dig holes for planting trees and shrubs.
122. Apply fertilizer and lime according to soil test results.
123. Prepare seedbeds for flowers, other annuals, bulbs, etc.
124. Plant trees and shrubs around clubhouse, entrance, and other prescribed areas.
125. Plant annuals, bulbs, etc. in prescribed areas.
126. Prune and trim trees and shrubs at correct time using proper equipment and methods.
127. Remove and/or relocate trees and shrubs.
128. Mow and edge lake banks and water hazards.
129. Select propagating stock.
132. Maintain and repair propagating structures and equipment.
133. Propagate different types of plants at the correct time using proper techniques and procedures.
137. Apply appropriate control measures.
139. Stake and/or provide protection for injured trees, newly transplanted trees, etc.
140. Install edging material.
141. Construct and maintain fences using different types of materials.
148. Keep work and storage areas neat and clean.
149. Clean hand tools and equipment.
150. Sharpen hand tools.
151. Grind and sharpen mower blades.
152. Backlap reels.
153. Set mowing heights and adjust reels to bedknife.
155. Change and set nozzles on spray equipment.
156. Check and change oil in motors on power-driven turf equipment.
158. Grease power-driven turf equipment.
159. Check and change air filters in power-driven turf equipment.
160. Check tires and tire pressure.
161. Check, refill, and charge batteries.
165. Tune-up vehicle and equipment by replacement of spark plugs and points.

Groundskeeper, Parks and Grounds

Job Description

Keeps grounds of city, State, or national park and playgrounds clean and repairs buildings and equipment. Mows lawns, using hand mower or power-driven lawnmower. Grubs and weeds around bushes, trees, and flower beds and trims hedges. Picks up and burns or carts away paper and rubbish.

Repairs and paints benches, tables, guardrails, and assists in repair of roads, walks, buildings, and mechanical equipment, using handtools. Cleans comfort stations and other buildings.

Tasks

The tasks performed by a Parks and Grounds Groundskeeper are the same as the tasks performed by an Industrial-Commercial Groundskeeper.

Lawn-Service Worker

Job Description

Cultivates lawns, using power aerator and thatcher and chemicals according to specifications. Lifts dead leaves and grass from between growing grass and soil, using thatcher. Pierces soil to make holes for fertilizer and water, using aerator. Presses aerator fork into soil and pulls rake through grass to cultivate areas not accessible to machines. Distributes granulated fertilizers, pesticides, and fungicides on lawn, using spreader. Records services rendered, materials used, and charges assessed on specified form. Transports thatcher, aerator, tools, and materials to and from job site, using truck with hydraulic lift-gate.

Tasks

The tasks performed by a Lawn-Service Worker are the same as the tasks performed by an Industrial-Commercial Groundskeeper.

Mechanic, Grounds Equipment

Job Description

Repairs fractional-horsepower gasoline engines used to power lawnmowers, garden tractors, and similar machines, using handtools. Locates causes of trouble, dismantles engines, using handtools, and examines parts for defects. Replaces or repairs parts, such as rings and bearings, using handtools. Cleans and adjusts carburetor and magneto. Starts repaired engines and listens to sounds to test performance. Replaces engines on machine.

Tasks

The following tasks may be performed:

148. Keep work and storage areas neat and clean.
149. Clean hand tools and equipment.
150. Sharpen hand tools.
151. Grind and sharpen mower blades.

152. Backlap reels.
153. Set mowing heights and adjust reels to backknife.
154. Change reels and verticut units on triple mowers.
155. Change and set nozzles on spray equipment.
156. Check and change oil in motors on power-driven turf equipment.
157. Check and change belts and chain drivers in power-driven turf equipment.
158. Grease power-driven turf equipment.
159. Check and change air filters in power-driven turf equipment.
160. Check tires and tire pressure.
161. Check, refill, and charge batteries.
162. Replace tines and blades on aerators, verticutters, slicers, and spikers.
163. Maintain and repair small gasoline engines.
164. Read and interpret owner's manual for ordering parts.
165. Tune-up vehicles and equipment by replacement of spark plugs and points.
179. Keep maintenance and repair records on equipment.
187. Order repair parts for business vehicles and equipment.

Job Description

Manages golf club to provide entertainment for patrons. Directs activities of dining room and kitchen workers and crews that maintain club buildings, equipment, and golf course in good condition. Hires and discharges workers. Estimates quantities and costs of foodstuffs, beverages, and groundskeeping equipment to prepare operating budget. Explains necessity of items on budget to board of directors and requests approval. Inspects club buildings, equipment, and golf course. Requisitions materials, such as foodstuffs, beverages, seeds, fertilizers, and groundskeeping equipment. Keeps accounts of receipts and expenditures. May assist in planning tournaments.

Tasks

The following tasks may be performed: (In addition to tasks performed by Golf Course Superintendent)

- 173. Prepare employee payroll.
- 174. Assist in records audit.
- 175. Assist in preparing income tax and other necessary reports.
- 176. Keep annual depreciation schedule.
- 178. Develop adequate record system for ordering and restocking plants, materials, supplies, repair parts, etc.
- 182. Take annual inventory for tax purposes.
- 185. Order replacement and/or new merchandise.
- 186. Arrange for transportation of materials purchased.
- 187. Order repair parts for business vehicles and equipment.
- 188. Understand and comply with business laws.
- 198. Identify and select producers and suppliers of plants, equipment, supplies, etc.
- 199. Order or purchase equipment, supplies, etc.
- 201. Establish employee wages, hours, and working conditions.
- 202. Administer social security and other employee benefit programs.
- 203. Determine need for, select reputable insurery and purchase comprehensive business insurance.
- 204. Determine business credit needs.
- 205. Locate sources of and secure credit.
- 206. Prepare annual budgets.

Superintendent, Golf Course

Job Description

Supervises and coordinates activities of workers engaged in constructing new areas and preserving golf course grounds. Plans work programs, utilizing experience and established agronomic practices, to improve and maintain turf and playing condition of course. Plans new areas or changes in course and directs workers engaged in cultivation, grading, seeding, and sodding of area. Reviews test results of soil and turf samples and directs application of fertilizer, lime, insecticide, and fungicide. Tours grounds to ascertain work progress and condition of course. Inspects turf to designate height and frequency of mowing, and determine need for supplemental irrigation to sustain or force growth. Reviews and keeps employee time records. Interviews, hires, and discharges workers. May assign workers to short-course training sessions related to course maintenance.

Tasks

The following tasks may be performed: (In addition to tasks performed by Golf Course Assistant Superintendent)

14. Read and interpret architectural designs.
15. Set and check grades.
16. Design and prepare scale drawings of proposed changes and/or additions.
17. Construct and read topographic maps from field data.
18. Determine square footage.
19. Compute tonnage and yardage of materials to be used in constructing a green or tee.
28. Lay out an irrigation system for tees and greens.
30. Plan and install drainage system.
31. Estimate cost of materials, manhours, equipment use, etc. for establishing tees and greens.
45. Develop annual fertilization and liming programs.
47. Develop irrigation programs and set automatic controllers.
52. Develop renovation, verticutting, and/or topdressing programs.
69. Read and interpret blueprints and plans.
70. Design and prepare scaled drawings of proposed changes and/or additions to plans to include trees and shrubs.
71. Compute acreage.
73. Determine total amount of amendments, fertilizers, and/or lime needs on an acreage basis.
74. Determine amount of seed or sprigs for acreage.
75. Compute amount of mulching material for acreage.
76. Designate equipment and steps to be used in land preparation.
80. Lay out irrigation system for fairways.
82. Plan and install drainage system.
85. Compute sand requirements for traps on a tonnage or yardage basis.
86. Select location for green and fairway traps.

- 95. Set boundaries on fairways.
- 98. Develop annual fertilization and liming programs.
- 101. Develop irrigation programs and set automatic controllers.
- 103. Develop program to re-establish fairways, roughs, and sand traps.
- 166. Prepare annual maintenance program for signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets.
- 191. Recruit, interview, and select employees.
- 209. Determine when facility should be opened and closed due to inclement weather.

Supervisor, Park Workers

Job Description

Supervises and coordinates activities of workers engaged in maintenance of areas, such as parks, botanical gardens, and playgrounds. Plans landscaping tasks, and instructs workers in the care of nursery, planting of flowers, and transplanting and pruning of trees and shrubbery. Directs workers in maintenance and repair of driveways, walks, hedges, swings, benches, and other park equipment. May patrol parks to guard against vandalism and destruction.

Tasks

The following tasks may be performed: (In addition to tasks performed by Industrial-Commercial Groundskeeper)

- 113. Identify and use drafting equipment.
- 114. Develop knowledge of landscape symbols.
- 115. Key and letter a drawing.
- 116. Survey the landscape area.
- 117. Develop landscape design for clubhouse, entrance, and other prescribed areas.
- 118. Prepare annual maintenance program for trees, shrubs, and other ornamentals.
- 119. Prepare annual maintenance program for lakes and ponds.
- 120. Take soil test and interpret results.
- 130. Have knowledge of propagating structures and equipment.
- 131. Have knowledge of propagating systems.
- 135. Identify pests, diseases, and weeds.
- 136. Determine methods of control needed to eradicate weeds, pests, and diseases.
- 142. Construct and maintain retaining walls using railroad ties, block, brick, rock, or other materials.
- 143. Construct walks and drives.
- 144. Construct patios and small terraces.
- 145. Construct benches.
- 146. Construct planters.
- 147. Erect proper lighting for specified areas.

CHAPTER IV

CURRICULUM GUIDE

AGRICULTURAL AND NATURAL RESOURCES EDUCATION

RECREATIONAL GROUNDS MANAGEMENT TECHNOLOGY

INTRODUCTION

Purpose of Curriculum

The Recreational Grounds Management curriculum is designed to provide students with the necessary knowledge, understanding, and skills to enable them to manage and maintain developed recreational and esthetic land areas. The curriculum is composed of courses drawn from the areas of ornamental horticulture, turf grass management, soil and water conservation, and forestry--as well as courses in communications and the social sciences.

Employment Opportunities

Employment for graduates of this program is found at golf courses and local, state, and national parks and gardens. Some of the employment opportunities for which graduates are qualified are lawn-service worker, greenskeeper, groundskeeper, grounds equipment mechanic, Assistant Superintendent and Superintendent, Golf Course, and Supervisor, Park Workers.

AGRICULTURE AND NATURAL RESOURCES EDUCATION

RECREATIONAL GROUNDS MANAGEMENT TECHNOLOGY

SUGGESTED CURRICULUM BY QUARTERS

			<u>Hours Per Week</u>			<u>Quarter</u>
<u>Course Title</u>			<u>Class</u>	<u>Lab.</u>	<u>Clin.</u>	<u>Hours</u>
<u>FIRST QUARTER</u>						
AGR	170	Plant Science	5	2	0	6
HOR	102	Introduction to Turf Grass Culture	3	2	0	4
BUS	109	Business Mathematics	5	0	0	5
ENG	101	Grammar	<u>3</u>	<u>0</u>	<u>0</u>	<u>3</u>
			16	4	0	18
<u>SECOND QUARTER</u>						
HOR	106	Turf Grass Establishment and Maintenance	3	2	0	4
HOR	107	Grass Management Equipment I	1	4	0	3
HOR	135	Landscape Drafting	2	4	0	4
CHM	101	Chemistry	4	2	0	5
ENG	102	Composition	<u>3</u>	<u>0</u>	<u>0</u>	<u>3</u>
			13	12	0	19
<u>THIRD QUARTER</u>						
AGR	185	Soil Science and Fertilizers	5	2	0	6
AGR	201	Agricultural Chemicals	3	2	0	4
HOR	105	Introduction to Golf	1	0	3	2
HOR	151	Plant Materials I	2	4	0	4
ENG	103	Report Writing	<u>3</u>	<u>0</u>	<u>0</u>	<u>3</u>
			14	8	3	19

Course Title		Hours Per Week			Quarter Hours Credit
		Class	Lab.	Clin.	
<u>FOURTH QUARTER</u>					
HOR 199	Cooperative Work Experience	0	0	40	4
HOR 299	Special Problems	<u>0</u>	<u>8</u>	<u>0</u>	<u>4</u>
		0	8	40	8
<u>FIFTH QUARTER</u>					
HOR 152	Plant Materials II	2	4	0	4
HOR 211	Irrigation and Drainage I	2	4	0	4
HOR 212	Seminar	1	4	0	3
HOR 251	Landscape Planning I	2	4	0	4
ENG 204	Oral Communication	<u>3</u>	<u>0</u>	<u>0</u>	<u>3</u>
		10	16	0	18
<u>SIXTH QUARTER</u>					
HOR 210	Turf Grass Pests and Pesticides	3	2	0	4
HOR 224	Landscape Maintenance	2	4	0	4
HOR 227	Grass Management Equipment II	1	4	0	3
BUS 272	Principles of Supervision	3	0	0	3
	Social Science Elective	<u>3</u>	<u>0</u>	<u>0</u>	<u>3</u>
		12	10	0	17
<u>SEVENTH QUARTER</u>					
HOR 216	Irrigation and Drainage II	2	4	0	4
HOR 258	Turf Grass Management	2	4	0	4
HOR 265	Recreational Grounds Management	2	4	0	4
	Social Science Elective	3	0	0	3
	Elective	<u>3</u>	<u>0</u>	<u>0</u>	<u>3</u>
		12	12	0	18
Total Quarter Hours Credit in Required Courses					110
Electives					<u>3</u>
Total					113
Cooperative Work Experience					<u>4</u>
TOTAL					117

AGRICULTURE AND NATURAL RESOURCES EDUCATION

RECREATIONAL GROUNDS MANAGEMENT TECHNOLOGY

COURSE DESCRIPTIONS BY QUARTER

	<u>Hours Per Week</u>			<u>Quarter</u>
	<u>Class</u>	<u>Lab.</u>	<u>Clin.</u>	<u>Hours</u>
				<u>Credit</u>
<u>FIRST QUARTER</u>				
<u>AGR 170 Plant Science</u>	5	2	0	6
An introductory general botany and crop science course covering the fundamental principles of the reproduction, growth, functions, and development of seed bearing plants. Prerequisite: None.				
<u>HOR 102 Introduction to Turf Grass Culture</u>	3	2	0	4
This course is designed to give the student an appreciation of the size, scope, and problems involved in turf grass production. Topics and discussions consist of: history of grasses, current trends, future projections, grass and seed identification, species characteristics, turf grass communities and the impact of the environment on turf grass culture. Prerequisite: None.				
<u>BUS 109 Business Mathematics</u>	5	0	0	5
This course was designed to provide a review of the fundamentals of arithmetic and their practical application to business problems in the processes of trading, operating, ownership, financing, investing, summarizing, and analyzing. Topics covered include cash and trade discounts, markup, interest, taxes, and pertinent uses of mathematics in business and industry. Prerequisite: None.				
<u>ENG 101 Grammar</u>	3	0	0	3
Designed to aid the student in the improvement of self-expression through writing. Emphasis is on grammar, diction, sentence structure, punctuation, and spelling. It is intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life. Prerequisite: None.				

SECOND QUARTER

HOR 106 Turf Grass Establishment and Maintenance

3 2 0 4

Principles of turf grass establishment are considered with special emphasis being placed on the following topics: site selection, soil testing, seedbed preparation, selection of species, planting of propagules and initial maintenance of newly established turf. Maintenance requirements as related to turf usage are examined thoroughly with attention focused on: fertilization, mowing, irrigation, thatch removal, aerification, overseeding, topdressing, and other maintenance aspects of the turf grass manager.

Prerequisite: None.

HOR 107 Grass Management Equipment I

1 4 0 3

This course is designed as a study of the operation and maintenance of specialized grass management equipment. Major topics discussed are: small engine use and repair; operation, maintenance and repair of grounds management equipment; organization and management of storage and shop areas; and safety considerations for operation and maintenance of equipment. Specifics include: operation and maintenance of establishment and renovation equipment, mowers, spreaders, sprayers and specialized shop equipment.

Prerequisite: None.

HOR 135 Landscape Drafting

2 4 0 4

A course designed to provide fundamental knowledge of the principles of drafting. Basic skills and techniques of drafting include the proper use and care of drafting equipment and supplies, lettering, sketching, line technique, geometric construction, instrument drawings of principle orthographic views, and dimension lines and numbers. Landscape symbols will also be studied.

Prerequisite: None.

CHM 101 Chemistry

4 2 0 5

Study of the physical and chemical properties of substances, chemical changes; elements, compounds, gases, chemical combinations; weights and measurements; theory of metals; acids, bases, salts, solvents, solutions, and emulsions. In addition, study of carbohydrates; electro-chemistry, electrolytes, and electrolysis in their application of chemistry to industry.

Prerequisite: BUS 109.

ENG 102 Composition

3 0 0 3

English composition is designed to aid the student in improvement of self-expression by means of practical application in business and technical writing. Emphasis is on writing sentences, paragraphs, and composition.

Prerequisite: ENG 101.

THIRD QUARTER

AGR 185 Soil Science and Fertilizers 5 2 0 6

A course dealing with the basic principles of efficient classification, evaluation, and management of soils; care, cultivation and fertilization of the soil, and conservation of soil fertility.

Prerequisite: None.

AGR 201 Agricultural Chemicals 3 2 0 4

A study of agricultural chemicals--their importance, ingredients, formulation, laws, and application with emphasis upon the effective and safe utilization of chemicals in agricultural pest control. Particular emphasis is placed upon weed identification and the chemicals utilized for weed control.

Prerequisite: None.

HOR 105 Introduction to Golf 1 0 3 2

An introductory course designed to acquaint the student with the game of golf and its application to turf management. Emphasis is placed on the history and development of the golf game and different playing areas; familiarization with golf equipment, basic rules of the game, and courtesy to fellow players and the course.

Prerequisite: None.

HOR 151 Plant Materials I 2 4 0 4

This course provides an introduction to the study of ornamental shrubs, annual, biennial and perennial plants, groundcovers, and vines that are used for landscape purposes. Students are required to identify each plant by its common and scientific name, describe its major uses in the landscape, and provide information on its cultural requirements.

Prerequisite: None.

ENG 103 Report Writing 3 0 0 3

The fundamentals of English are utilized as a background for the organization and techniques of report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term.

The report must relate to the student's specific curriculum.

Prerequisite: ENG 102.

FOURTH QUARTER

HOR 199 Cooperative Work Experience 0 0 40 4

The objective of this course is to provide the student with work experience like that of employment. This period of time will enable the student to use the equipment and perform the processes and services required of the specialty. This experience will be carefully planned and closely supervised by both educational institution and the agency of business where the student is employed. An official agreement among the educational institution, the student, and the agency or business will provide for a programmed sequence of activities to be performed by the student with supervisory responsibilities for the educational elements of the work clearly defined.

Prerequisite: A minimum of two quarters of class and laboratory work.

HOR 299 Special Programs 0 8 0 4

Individual studies and reports on problems of interest to the student under the guidance of an instructor.

Prerequisite: A minimum of two quarters of classwork.

FIFTH QUARTER

HOR 152 Plant Materials II 2 4 0 4

A study of selected evergreen and deciduous trees including large shrubs which are often considered small trees that are designed for landscape purposes. Identification, cultural requirements, and uses of selected trees and large shrubs will be covered.

Prerequisite: HOR 151.

HOR 211 Irrigation and Drainage I 2 4 0 4

An introductory course to simple surveying with emphasis being placed on deriving field notes and the transfer of these notes to plot layouts. Subject matter includes measurement of distance and areas, placement of existing objects, levels and leveling, topographic mapping, rainfall and runoff, wind and water erosion, erosion control structures, surface and sub-surface drainage, and the types of irrigation and drainage systems.

Prerequisite: None.

HOR 212 Seminar 1 4 0 3

This course is designed to give the student an opportunity for evaluation of work experience and special problems along with that performed by his or her peers. Each student will be required to present an oral and written report for the recreational grounds facility in which he or she gained work experience. These experiences will be further reinforced through the use of field trips and resource personnel.

Prerequisite: HOR 199.

HOR 251 Landscape Planning I

2 4 0 4

An introduction to blueprint reading and an introductory study of the basic principles of landscape design. The course is oriented toward an understanding of basic principles fundamental to all landscape design endeavors. However, emphasis is placed upon students developing residential site plans.

Prerequisite: HOR 135.

ENG 204 Oral Communication

3 0 0 3

The principles, techniques, and practical applications of communicating the thoughts and personality through the voice and visible action of the individual to one or more persons for the purpose of achieving a previously determined response. Areas covered vary according to class needs, but in general, include: basic concepts, nonverbal and verbal language, vocal usage, speech preparation (analyzing audience and occasion, determining purpose, selecting and narrowing subject, gathering and organizing material, wording and practicing aloud), and effective listening.

Prerequisite: None.

SIXTH QUARTER

HOR 210 Turf Grass Pests and Pesticides

3 2 0 4

This course stresses the importance of identifying and safely controlling turf grass pests. Topics covered include insects, weeds, diseases, nematodes, insecticides, herbicides, fungicides, application procedures and costs involved in control programs.

Prerequisite: None.

HOR 224 Landscape Maintenance

2 4 0 4

The principles and techniques of maintaining lawns, shrubs, trees, flowers, bulbs, and other plantings. Included is fertilization, disease control, pruning, irrigation, and proper use of various herbicides and pesticides.

Prerequisites: AGR 185, AGR 201, HOR 151.

HOR 227 Grass Management Equipment II

1 4 0 3

A continuation of HOR 107 with emphasis on the repair of equipment necessary for grounds establishment and maintenance.

Prerequisite: HOR 107.

BUS 272 Principles of Supervision

3 0 0 3

This course is designed for present and prospective supervisors who have the need and desire to participate in learning activities that will assist the participants in becoming more effective supervisors. The student will study organizational goals and objectives, training and instructional techniques, evaluation and counseling, delegation, planning and organizing and problem solving. Successful completion of this course should provide the student with a better understanding of various techniques which can be used to improve effectiveness as a supervisor.

Prerequisite: None.

SEVENTH QUARTER

HOR 216 Irrigation and Drainage II

2 4 0 4

This course deals with basic techniques involved in the design, layout, installation and use of irrigation and drainage systems. Topics covered include gathering field data through surveys, types of irrigation and drainage systems, components of these systems, materials available for use, economic considerations and use from the maintenance supervisor's standpoint.

Prerequisite: HOR 211.

HOR 258 Turf Grass Management

2 4 0 4

Identification and use of the various turf grasses used in residential and commercial lawns with an explanation of the principles of turf grass management. The course includes actual field problems in preparing the soil, seeding, sprigging, laying sod and irrigation of turf grasses. Operation and Maintenance of turf equipment will also be emphasized.

Prerequisites: AGR 185, AGR 201, HOR 148.

HOR 265 Recreational Grounds Management

2 4 0 4

This course offers the student an opportunity to combine the technical aspects and practical knowledge gained during previous instruction into broad management plans. Topics of consideration include: responsibilities of the superintendent, training and administration of workmen, work scheduling, purchasing and requisitioning, systems or organizations, working relationships, communications, public relations, and budgeting. Each student will be required to develop management programs for turf grass facilities assigned by the instructor.

Prerequisites: HOR 199, HOR 212.

ELECTIVES

An appropriate list of electives for Recreational Grounds Management Technology is given below. Institutions may select from these elective courses to complete the program of study or an institution has the prerogative to develop new courses for the electives or modify courses from the suggested list to fulfill local objectives. It is suggested, however, that technical courses be appropriate to the major area of study; that they not change or alter the major objectives of the program or create a false impression of proficiency in an area either related or foreign to the major.

Elective courses must be selected from an associate degree course or new courses should be developed at a comparable level. The institution may elect to require certain courses or may let the student select an appropriate course.

Horticulture

<u>HOR 103 Plant Growing Facilities</u>	3	2	0	4
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Basic principles and problems involved in the planning, operation, and maintenance of growing facilities for plants.

<u>HOR 144 Plant Propagation</u>	3	2	0	4
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A study of basic concepts and principles of sexual and asexual propagation. Techniques are learned through practical exercises conducted in laboratory sessions. Emphasis is given to those propagation methods widely utilized in the horticulture industry.

<u>HOR 201 Property Law and Basic Surveying</u>	3	2	0	4
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The study of federal, state and county and municipal laws and regulations affecting the ownership and management of public, corporate, and private lands, especially pertaining to the growth and maintenance of trees and ornamental plants. The mechanics and legalities of property line location, including fundamental surveying techniques, will be studied.

<u>HOR 252 Landscape Planning II</u>	2	4	0	4
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A continuation of HOR 251 with increased emphasis on the planning, development, and design of residential and commercial landscape areas. An introduction to elementary surveying will be included. In addition, fundamentals of landscape economics such as costs, contracts, calculating areas, volumes, and plant quantities for landscape projects will be covered.

HOR 253 Arboriculture

2 4 0 4

Arboriculture involves the principles and practices of selection, use, establishment, and care of shade and ornamental trees. Practical applications in the course include climbing, pruning, bracing, and other physical operations required of skilled tree workers.

HOR 260 Landscape Construction

2 4 0 4

This course is designed to teach the student how to plan the total landscape environment. Emphasis will be placed on the construction of and proper placement of masonry walls, rock walls, patios, walks, etc., blending them in with appropriate plant materials.

Business

BUS 102 Typewriting

2 3 0 3

The student will be introduced to the touch typewriting system and will learn to use proper typing techniques, master the keyboard, type personal letters and postal cards and be able to tabulate. Upon completion of the course, the student will be able to type 30 words per minute for three minutes.

BUS 110 Office Machines

2 3 0 3

The student will be introduced to machines currently being used in business and industry. The student will learn the techniques, processes and operations of machines such as the ten-key adding machine, calculator, etc. and be able to apply these knowledges.

BUS 115 Business Law I

3 0 0 3

This course is designed for students who need an understanding of substantive business law. The student will be able to define business law terminology and state involvement of business law in the following areas: nature and sources of our legal system, contracts, sales, commercial papers, bailments and agency.

DMK 132 Sales Development

3 2 0 4

The student will be able to apply selling principles through preparation for and demonstration of a sale.

BUS 195 Small Business Operations

3 0 0 3

An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations.

Social Science

SOC 101 Sociology

3 0 0 3

A study of basic sociology principles and of the basic process of group behavior. Includes the study of social interaction, family and group life, social institutions, status and role, culture, population, structure and change, and community structure, both urban and rural.

SOC 102 Principles of Sociology

5 0 0 5

An introductory course to the principles of sociology. An attempt to provide an understanding of culture, collective behavior, community life, social institutions and social change. Presents the scientific study of man's behavior in relation to other men, the general laws affecting the organization of such relationships and the effects of social life on human personality and behavior.

SOC 207 Rural Society

3 0 0 3

A study of selected elements of rural sociology with emphasis on current social changes. The course provides a sociological background for the understanding of rural social changes. Areas of study include rural culture, group relationships, social classes, rural and suburban communities, farm organizations, the communication of agricultural technology, rural social problems, agricultural adjustment and population change.

SOC 211 Marriage and Family

3 0 0 3

This course is designed to aid the student in understanding marriage and family living. The student will study marriage and family relationships and the role families play in the development of children.

SSC 201 Social Science

3 0 0 3

An integrated course in the social sciences, drawing from the fields of anthropology, psychology, history, and sociology.

SSC 202 Social Science

3 0 0 3

A further study of social sciences, with emphasis on economics, political science, and social problems as they relate to the individual.

SSC 205 American Institutions

3 0 0 3

A study of the effect of American social, economic, and political institutions upon the individual as a citizen and as a worker. The course dwells upon current local, national, and global problems viewed in the light of our political and economic heritage.

PSY 110 General Psychology

3 0 0 3

An introduction to the principles of human behavior. Includes a brief history of psychology as a science, basic psychological processes, personality and social behavior, contemporary knowledge of motives, intelligence, learning and emphasis on methods of communications and the understanding of self and others. The beginning concepts of approaches that are therapeutic in the people relationship are presented.

PSY 206 Applied Psychology

3 0 0 3

A study of the principles of psychology that will be of assistance in the understanding of interpersonal relations on the job. Motivation, feelings and emotions are considered with particular reference to on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflicts. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general community.

APPENDICES

APPENDIX A

RECREATIONAL GROUNDS MANAGEMENT TECHNOLOGY

WORKING COMMITTEE

Harry DuBose, Chairperson
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RALEIGH 27611

APPENDIX B-1

INTRODUCTORY CAREER OPPORTUNITY LETTER

M E M O R A N D U M

TO: Selected Golf Course Managers/Superintendents
FROM: Coy L. Hudson, Assistant Director, Special Programs
SUBJECT: Career Opportunity Survey

The Occupational Program Services Division, Department of Community Colleges, is conducting a project to determine the competencies required by employers in order for their employees to be successful on the job. This project is designed to: (1) develop a validated list of tasks performed by employees in a given job; (2) develop from the tasks, competencies that are required to perform successfully in the job (3) develop curriculum guidelines; and (4) develop and/or revise curriculum materials based on the guidelines to assist educational personnel in providing quality occupational education programs. You, as a member of the employment field, can provide essential information for the development of competency-based programs.

You have been selected to assist in determining employment opportunities in the field of recreational grounds management. The enclosed form identifies careers open to individuals in this field. These opportunities may or may not exist. Your response to the survey will contribute to the identification and validation of jobs that do exist.

After you have completed the survey, please return it in the stamped, self-addressed envelope by _____. Your responses will be compiled with the responses of other individuals completing the survey, with no individual responses identified.

Your participation in this project by the completion of this survey is greatly appreciated.

CLH/ljp

APPENDIX B-2

CAREER OPPORTUNITY SURVEY

RECREATIONAL GROUNDS MANAGEMENT TECHNOLOGY

The following employment opportunities have been identified as being possible careers open to individuals in recreational grounds management. These career opportunities may or may not exist.

Please indicate your opinion as to whether these employment opportunities do exist by checking (✓) the yes or no block next to the career identified. Please add comments if you desire that help explain your response.

D.O.T. CODE	CAREER OPPORTUNITY	YES	NO	COMMENTS
406.137-010	Assistant Superintendent, Golf Course			
406.683-010	Greenskeeper			
406.684-014	Groundskeeper, Industrial - Commercial			
406.687-010	Groundskeeper, Parks and Grounds			
408.684-010	Lawn-Service Worker			
625.281-034	Mechanic, Grounds Equipment			
187.167-114	Manager, Golf Course			
406.137-014	Superintendent, Golf Course			
406.134-014	Supervisor, Park Workers			
	Others			

APPENDIX B-3

CAREER OPPORTUNITY SURVEY RESULTS

RECREATIONAL GROUNDS MANAGEMENT TECHNOLOGY

The following information was obtained by surveying a random sample of golf club managers/superintendents who are employed at the various golf courses in North Carolina. A total of 150 surveys were mailed and 80 were returned, or 53%. This information assists in validating the employment opportunities that are available in North Carolina in the field of recreational grounds management.

D.O.T. CODE	CAREER OPPORTUNITY	YES	NO	NO RESPONSE
406.137-010	Assistant Superintendent, Golf Course	75	2	3
406.683-010	Greenskeeper	77	3	0
406.684-014	Groundskeeper, Industrial - Commercial	68	7	5
406.687-010m	Groundskeeper, Parks and Grounds	70	6	4
408.684-010	Lawn-Service Worker	66	10	4
625.281-034	Mechanic, Grounds Equipment	69	8	3
187.167-114	Manager, Golf Course	78	0	2
406.137-014	Superintendent, Golf Course	77	1	2
406.134-014	Supervisor, Park Workers	72	4	4



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APPENDIX C-1

INTRODUCTORY TASK VALIDATION LETTER

MEMORANDUM

TO: Golf Course Managers/Superintendents

FROM: Coy L. Hudson, Assistant Director, Special Programs

SUBJECT: Task Inventory of Recreational Grounds Management Occupations

The Department of Community Colleges is conducting a project to evaluate and update its Recreational Grounds Management curriculum. The first step in this project was to identify appropriate positions or job opportunities that may be held by graduates of this program--golf course manager, superintendent, assistant superintendent, greenskeeper, grounds equipment mechanic, groundskeeper, lawn-service worker, and supervisor, park workers.

The second step in this project is to identify the tasks and levels of competency needed in order to perform satisfactorily in the various occupations. Enclosed is an inventory of tasks that hopefully you as a golf course manager or superintendent will respond to in terms of which tasks are necessary and the level of competency of each task. Your opinion on this inventory will provide guidance for the development of quality recreational grounds management programs in the community college system.

Please assist us with this project by completing the enclosed task inventory. Also, please ask one of your golf course employees to complete this task inventory. An extra form is included for his/her use. Just follow the simple directions and return the inventory in the stamped, self-addressed envelope by . Your responses will be compiled with the responses of other individuals completing the inventory, with no individual responses identified.

Later in the project, there will be a need for a group of industry representatives and our instructors to meet several times to make an analysis of the tasks. If you would like to be a member of this committee, please complete the attached form and enclose it with the task inventory.

Thank you very much for assisting in this project.

CLH/ljp

Enclosure

APPENDIX C-2

COMPETENCY-BASED RECREATIONAL GROUNDS MANAGEMENT CURRICULUM STUDY

TASKS PERFORMED BY GOLF COURSE MANAGER, SUPERINTENDENT,
ASSISTANT SUPERINTENDENT, GREENSKEEPER, GROUNDS EQUIPMENT MECHANIC,
GROUNDSKEEPER, LAWN-SERVICE WORKER, AND SUPERVISOR, PARK WORKERS

Directions: The following inventory is a list of tasks which may or may not be performed by persons in golf course occupations. Please use the following key to make your evaluation of the level of competence of each task. The person should possess:

1. no competency in this activity
2. slight competency in this activity
3. moderate competency in this activity
4. considerable competency in this activity
5. complete competency in this activity

Please answer all questions. There are no right or wrong answers. What is important is how you rate each competency.

Please circle the rating (1-2-3-4-5) which best indicates your feelings as to the level of competency of each task. At times your exact feelings will not be represented, but select the answer nearest your feelings. Please do not omit any tasks. Also, at the end of the task listing, please add additional tasks which you feel individuals need in recreational grounds occupations and rate each task you add.

DATA PROCESSING CODE

1
2
3
4
5
6
7
8
9
10

no
slight
moderate
considerable
complete

Definition: Competent (Webster) 1. Well qualified; capable; fit.

Competency (Webster) 2. Condition or quality of being competent.

TASKS

A. Plant Identification and Cultural Requirements

- | | | |
|-----|-----------|--|
| 11. | 1 2 3 4 5 | Identify selected species of plants by common and scientific name (grasses, ornamentals, perennials, trees, etc.). |
| 12. | 1 2 3 4 5 | Use resource material to identify unknown plants which cannot be identified by visual inspection. |

no
slight
moderate
considerable
complete

TASKSA. Plant Identification and Cultural Requirements (Continued)

13. 1 2 3 4 5 Have knowledge of cultural requirements of plants (light, soil, temperature, shade, etc.).

B. Establishment of Greens and Tees

14. 1 2 3 4 5 Read and interpret architectural designs.
15. 1 2 3 4 5 Set and check grades.
16. 1 2 3 4 5 Design and prepare scale drawings of proposed changes and/or additions.
17. 1 2 3 4 5 Construct and read topographic maps from field data.
18. 1 2 3 4 5 Determine square footage.
19. 1 2 3 4 5 Compute tonnage and yardage of materials to be used in constructing a green or tee.
20. 1 2 3 4 5 Take soil samples for physical and chemical analysis.
21. 1 2 3 4 5 Interpret physical and chemical analysis of soils and make recommendations.
22. 1 2 3 4 5 Mix and transport media.
23. 1 2 3 4 5 Calibrate spreaders and compute total amount of lime and/or fertilizer required in seedbed preparation.
24. 1 2 3 4 5 Select and determine amount of seed, sprigs or sod required in establishment.
25. 1 2 3 4 5 Select and determine amount of mulch material required.
26. 1 2 3 4 5 Remove trees and debris.
27. 1 2 3 4 5 Plow, disk, and rake area.
28. 1 2 3 4 5 Lay out an irrigation system for tees and greens.
29. 1 2 3 4 5 Install irrigation system.
30. 1 2 3 4 5 Plan and install drainage system.

no
slight
moderate
considerable
complete

TASKSB. Establishment of Greens and Tees (Continued)

- | | | |
|-----|-----------|---|
| 31. | 1 2 3 4 5 | Estimate cost of materials, manhours, equipment use, etc. for establishing tees and greens. |
| 32. | 1 2 3 4 5 | Select planting dates. |
| 33. | 1 2 3 4 5 | Level and sterilize seedbed. |
| 34. | 1 2 3 4 5 | Apply fertilizer and lime. |
| 35. | 1 2 3 4 5 | Mix seed. |
| 36. | 1 2 3 4 5 | Sow seed, sprig, stolonize, plug, or sod. |
| 37. | 1 2 3 4 5 | Roll after planting. |
| 38. | 1 2 3 4 5 | Apply mulching materials. |
| 39. | 1 2 3 4 5 | Irrigate new plantings. |
| 40. | 1 2 3 4 5 | Fertilize new plantings. |
| 41. | 1 2 3 4 5 | Mow new plantings. |
| 42. | 1 2 3 4 5 | Mix and apply pesticides to new plantings. |

C. Maintenance of Greens and Tees

- | | | |
|-----|-----------|--|
| 43. | 1 2 3 4 5 | Develop and prescribe mowing patterns, height of cut, type of mower and frequency of mowing. |
| 44. | 1 2 3 4 5 | Mow greens, collars, aprons, and tees. |
| 45. | 1 2 3 4 5 | Develop annual fertilization and liming programs. |
| 46. | 1 2 3 4 5 | Calibrate spreaders and keep records of settings. |
| 47. | 1 2 3 4 5 | Develop irrigation programs and set automatic controllers. |
| 48. | 1 2 3 4 5 | Irrigate turf. |
| 49. | 1 2 3 4 5 | Relocate and replace cups. |
| 50. | 1 2 3 4 5 | Relocate and replace tee markers. |

	no	slight	moderate	considerable	complete	TASKS
C.	<u>Maintenance of Greens and Tees</u>					
51.	1	2	3	4	5	Repair divots.
52.	1	2	3	4	5	Develop renovation, verticutting, and/or topdressing programs.
53.	1	2	3	4	5	Apply fertilizer and lime according to soil test results.
54.	1	2	3	4	5	Aerify, slice, and spike turf.
55.	1	2	3	4	5	Remove plugs.
56.	1	2	3	4	5	Verticut and remove verticut debris from turf.
57.	1	2	3	4	5	Sterilize topdressing material.
58.	1	2	3	4	5	Mix and apply topdressing material.
59.	1	2	3	4	5	Distribute topdressing with dragmat.
60.	1	2	3	4	5	Overseed and reseed turf.
61.	1	2	3	4	5	Report pest problems.
62.	1	2	3	4	5	Identify insects, diseases, and weeds which commonly infest turf areas.
63.	1	2	3	4	5	Use professional or governmental agencies to identify unusual pests and make recommendations.
64.	1	2	3	4	5	Obtain, package, and mail samples of pests to be identified.
65.	1	2	3	4	5	Obtain a commercial pesticide applicators license.
66.	1	2	3	4	5	Select and mix insecticides, fungicides, and herbicides for prevention or control.
67.	1	2	3	4	5	Calibrate sprayers and apply pesticides, herbicides, etc.
68.	1	2	3	4	5	Take nematode assays.

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slight
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considerable
complete

TASKS

D. Establishment of Fairways, Roughs, and Sand Traps

- | | | |
|-----|-----------|---|
| 69. | 1 2 3 4 5 | Read and interpret blueprints and plans. |
| 70. | 1 2 3 4 5 | Design and prepare scaled drawings of proposed changes and/or additions to plans to include trees and shrubs. |
| 71. | 1 2 3 4 5 | Compute acreage. |
| 72. | 1 2 3 4 5 | Take soil test and interpret results. |
| 73. | 1 2 3 4 5 | Determine total amount of amendments, fertilizers, and/or lime needs on an acreage basis. |
| 74. | 1 2 3 4 5 | Determine amount of seed or sprigs for acreage. |
| 75. | 1 2 3 4 5 | Compute amount of mulching material for acreage. |
| 76. | 1 2 3 4 5 | Designate equipment and steps to be used in land preparation. |
| 77. | 1 2 3 4 5 | Remove trees and debris. |
| 78. | 1 2 3 4 5 | Plow, disk, rake, or otherwise prepare land. |
| 79. | 1 2 3 4 5 | Apply fertilizer, lime, and/or other soil amendments. |
| 80. | 1 2 3 4 5 | Lay out irrigation system for fairways. |
| 81. | 1 2 3 4 5 | Install irrigation system. |
| 82. | 1 2 3 4 5 | Plan and install drainage system. |
| 83. | 1 2 3 4 5 | Level and smooth land preparatory to planting. |
| 84. | 1 2 3 4 5 | Stabilize steep banks. |
| 85. | 1 2 3 4 5 | Compute sand requirements for traps on a tonnage or yardage basis. |
| 86. | 1 2 3 4 5 | Select location for green and fairway traps. |
| 87. | 1 2 3 4 5 | Dig out sand traps, install drainage, and select and add sand. |
| 88. | 1 2 3 4 5 | Seed or sprig fairways and roughs at proper time. |

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TASKSD. Establishment of Fairways, Roughs, and Sand Traps (Continued)

- | | | |
|-----|-----------|---|
| 89. | 1 2 3 4 5 | Identify pests, diseases, and weeds. |
| 90. | 1 2 3 4 5 | Select and apply proper preventive or curative measures for pests, diseases, and weeds. |
| 91. | 1 2 3 4 5 | Plant and/or transplant trees and shrubs. |
| 92. | 1 2 3 4 5 | Irrigate newly planted turf, trees, and shrubs. |
| 93. | 1 2 3 4 5 | Fertilize newly planted turf, trees, and shrubs. |
| 94. | 1 2 3 4 5 | Mow newly planted turf grasses. |
| 95. | 1 2 3 4 5 | Set boundaries on fairways. |

E. Maintenance of Fairways, Roughs, and Traps

- | | | |
|------|-----------|--|
| 96. | 1 2 3 4 5 | Develop and prescribe mowing patterns, height of cut, type of mower and frequency of mowing. |
| 97. | 1 2 3 4 5 | Mow fairways and roughs. |
| 98. | 1 2 3 4 5 | Develop annual fertilization and liming programs. |
| 99. | 1 2 3 4 5 | Calibrate spreaders and keep records of settings. |
| 100. | 1 2 3 4 5 | Apply fertilizer and lime according to soil test results. |
| 101. | 1 2 3 4 5 | Develop irrigation programs and set automatic controllers. |
| 102. | 1 2 3 4 5 | Irrigate established fairways. |
| 103. | 1 2 3 4 5 | Develop program to re-establish fairways, roughs, and sand traps. |
| 104. | 1 2 3 4 5 | Re-establish turf by seeding, sprigging, or sodding. |
| 105. | 1 2 3 4 5 | Repair irrigation and drainage systems. |
| 106. | 1 2 3 4 5 | Repair worn areas. |

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TASKS

E. Maintenance of Fairways, Roughs, and Traps (Continued)

- | | | |
|------|-----------|--|
| 107. | 1 2 3 4 5 | Mix and apply proper pesticides and herbicides to control or prevent insects, diseases, and weeds. |
| 108. | 1 2 3 4 5 | Rake sand traps. |
| 109. | 1 2 3 4 5 | Add sand to traps. |
| 110. | 1 2 3 4 5 | Trim and edge sand traps. |
| 111. | 1 2 3 4 5 | Take nematode assay. |
| 112. | 1 2 3 4 5 | Overseed fairways. |

F. Grounds Establishment and Maintenance

- | | | |
|------|-----------|--|
| 113. | 1 2 3 4 5 | Identify and use drafting equipment. |
| 114. | 1 2 3 4 5 | Develop knowledge of landscape symbols. |
| 115. | 1 2 3 4 5 | Key and letter a drawing. |
| 116. | 1 2 3 4 5 | Survey the landscape area. |
| 117. | 1 2 3 4 5 | Develop landscape design for clubhouse, entrance, and other prescribed areas. |
| 118. | 1 2 3 4 5 | Prepare annual maintenance program for trees, shrubs, and other ornamentals. |
| 119. | 1 2 3 4 5 | Prepare annual maintenance program for lakes and ponds. |
| 120. | 1 2 3 4 5 | Take soil test and interpret results. |
| 121. | 1 2 3 4 5 | Dig holes for planting trees and shrubs. |
| 122. | 1 2 3 4 5 | Apply fertilizer and lime according to soil test results. |
| 123. | 1 2 3 4 5 | Prepare seedbeds for flowers, other annuals, bulbs, etc. |
| 124. | 1 2 3 4 5 | Plant trees and shrubs around clubhouse, entrance, and other prescribed areas. |

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TASKSF. Grounds Establishment and Maintenance (Continued)

- | | | |
|------|-----------|---|
| 125. | 1 2 3 4 5 | Plant annuals, bulbs, etc. in prescribed areas. |
| 126. | 1 2 3 4 5 | Prune and trim trees and shrubs at correct time using proper equipment and methods. |
| 127. | 1 2 3 4 5 | Remove and/or relocate trees and shrubs. |
| 128. | 1 2 3 4 5 | Mow and edge lake banks and water hazards. |
| 129. | 1 2 3 4 5 | Select propagating stock. |
| 130. | 1 2 3 4 5 | Have knowledge of propagating structures and equipment. |
| 131. | 1 2 3 4 5 | Have knowledge of propagating systems. |
| 132. | 1 2 3 4 5 | Maintain and repair propagating structures and equipment. |
| 133. | 1 2 3 4 5 | Propagate different types of plants at the correct time using proper techniques and procedures. |
| 134. | 1 2 3 4 5 | Repair cart paths. |
| 135. | 1 2 3 4 5 | Identify pests, diseases, and weeds. |
| 136. | 1 2 3 4 5 | Determine methods of control needed to eradicate weeds, pests, and diseases. |
| 137. | 1 2 3 4 5 | Apply appropriate control measures. |
| 138. | 1 2 3 4 5 | Rope off and direct traffic. |
| 139. | 1 2 3 4 5 | Stake and/or provide protection for injured trees, newly transplanted trees, etc. |
| 140. | 1 2 3 4 5 | Install edging material. |

G. Construction of Permanent and Semi-Permanent Landscape Features

- | | | |
|------|-----------|---|
| 141. | 1 2 3 4 5 | Construct and maintain fences using different types of materials. |
| 142. | 1 2 3 4 5 | Construct and maintain retaining walls using railroad ties, block, brick, rock, or other materials. |

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TASKSG. Construction of Permanent and Semi-Permanent Landscape Features (Cont'd)

- | | | |
|------|-----------|--|
| 143. | 1 2 3 4 5 | Construct walks and drives. |
| 144. | 1 2 3 4 5 | Construct patios and small terraces. |
| 145. | 1 2 3 4 5 | Construct benches. |
| 146. | 1 2 3 4 5 | Construct planters. |
| 147. | 1 2 3 4 5 | Erect proper lighting for specified areas. |

H. Maintenance of Buildings and Equipment

- | | | |
|------|-----------|--|
| 148. | 1 2 3 4 5 | Keep work and storage areas neat and clean. |
| 149. | 1 2 3 4 5 | Clean hand tools and equipment. |
| 150. | 1 2 3 4 5 | Sharpen hand tools. |
| 151. | 1 2 3 4 5 | Grind and sharpen mower blades. |
| 152. | 1 2 3 4 5 | Backlap reels. |
| 153. | 1 2 3 4 5 | Set mowing heights and adjust reels to bedknife. |
| 154. | 1 2 3 4 5 | Change reels and verticut units on triplex mowers. |
| 155. | 1 2 3 4 5 | Change and set nozzles on spray equipment. |
| 156. | 1 2 3 4 5 | Check and change oil in motors on power driven turf equipment. |
| 157. | 1 2 3 4 5 | Check and change belts and chain drivers in power driven turf equipment. |
| 158. | 1 2 3 4 5 | Grease power driven turf equipment. |
| 159. | 1 2 3 4 5 | Check and change air filters in power driven turf equipment. |
| 160. | 1 2 3 4 5 | Check tires and tires pressure. |
| 161. | 1 2 3 4 5 | Check, refill, and charge batteries. |

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Appendix

TASKS

H. Maintenance of Buildings and Equipment (Continued)

- | | | |
|------|-----------|--|
| 162. | 1 2 3 4 5 | Replace tines and blades on aerators, verticutters, slicers, and spikers. |
| 163. | 1 2 3 4 5 | Maintain and repair small gasoline engines. |
| 164. | 1 2 3 4 5 | Read and interpret owner's manual for ordering parts. |
| 165. | 1 2 3 4 5 | Tune-up vehicles and equipment by replacement of spark plugs and points. |
| 166. | 1 2 3 4 5 | Prepare annual maintenance program for signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets. |
| 167. | 1 2 3 4 5 | Maintain, clean, and repair, when appropriate, signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets. |

I. Records

- | | | |
|------|-----------|---|
| 168. | 1 2 3 4 5 | Keep employee time records. |
| 169. | 1 2 3 4 5 | Keep records of receipts and expenses. |
| 170. | 1 2 3 4 5 | Keep records of fertilizers, lime, and pesticides applied. |
| 171. | 1 2 3 4 5 | Keep records of gasoline usage. |
| 172. | 1 2 3 4 5 | Keep daily and yearly rainfall and weather records. |
| 173. | 1 2 3 4 5 | Prepare employee payroll. |
| 174. | 1 2 3 4 5 | Assist in records audit. |
| 175. | 1 2 3 4 5 | Assist in preparing income tax and other necessary reports. |
| 176. | 1 2 3 4 5 | Keep annual depreciation schedule. |
| 177. | 1 2 3 4 5 | File records and other materials. |

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complete

TASKSI. Records (Continued)

178. 1 2 3 4 5 Develop adequate record system for ordering and restocking plants, materials, supplies, repair parts, etc.
179. 1 2 3 4 5 Keep maintenance and repair records on equipment.

J. Inventory

180. 1 2 3 4 5 Keep current inventory of supplies, repair parts, oil and grease, seed, fertilizers, lime, pesticides, etc.
181. 1 2 3 4 5 Check received merchandise against invoice listings.
182. 1 2 3 4 5 Take annual inventory for tax purposes.
183. 1 2 3 4 5 Check invoices for math errors.
184. 1 2 3 4 5 Store received merchandise.
185. 1 2 3 4 5 Order replacement and/or new merchandise.
186. 1 2 3 4 5 Arrange for transportation of materials purchased.
187. 1 2 3 4 5 Order repair parts for business vehicles and equipment.

K. Management

188. 1 2 3 4 5 Understand and comply with business laws.
189. 1 2 3 4 5 Understand and comply with OSHA and EPA regulations.
190. 1 2 3 4 5 Identify labor needs.
191. 1 2 3 4 5 Recruit, interview, and select employees.
192. 1 2 3 4 5 Designate and prepare work schedules for employees.
193. 1 2 3 4 5 Train new employees.

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TASKSK. Management (Continued)

- | | | |
|------|-----------|--|
| 194. | 1 2 3 4 5 | Supervise employees. |
| 195. | 1 2 3 4 5 | Evaluate employee performance. |
| 196. | 1 2 3 4 5 | Recommend personnel actions such as promoting, firing, disciplinary action. |
| 197. | 1 2 3 4 5 | Identify equipment and supply needs. |
| 198. | 1 2 3 4 5 | Identify and select producers and suppliers of plants, equipment, supplies, etc. |
| 199. | 1 2 3 4 5 | Order or purchase equipment, supplies, etc. |
| 200. | 1 2 3 4 5 | Enforce safety regulations. |
| 201. | 1 2 3 4 5 | Establish employee wages, hours, and working conditions. |
| 202. | 1 2 3 4 5 | Administer social security and other employee benefit programs. |
| 203. | 1 2 3 4 5 | Determine need for, select reputable insurery and purchase comprehensive business insurance. |
| 204. | 1 2 3 4 5 | Determine business credit needs. |
| 205. | 1 2 3 4 5 | Locate sources of and secure credit. |
| 206. | 1 2 3 4 5 | Prepare annual budgets. |
| 207. | 1 2 3 4 5 | Keep golfers informed of problems, changes, and/or additions to course. |
| 208. | 1 2 3 4 5 | Have a good knowledge of playing golf. |
| 209. | 1 2 3 4 5 | Determine when facility should be opened and closed due to inclement weather. |

L. Professional Improvement

- | | | |
|------|-----------|---|
| 210. | 1 2 3 4 5 | Be familiar with various professional and trade associations and make decision about membership in these organizations. |
|------|-----------|---|

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TASKSL. Professional Improvement (Continued)

211. 1 2 3 4 5 Be aware of how and where to find current information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.
212. 1 2 3 4 5 Have knowledge of and subscribe to various professional and trade publications.

Please list and rate any additional tasks that you feel were not included in the Total Task Inventory.

213. 1 2 3 4 5

214. 1 2 3 4 5

215. 1 2 3 4 5

216. 1 2 3 4 5

217. 1 2 3 4 5

218. 1 2 3 4 5

PLEASE PROVIDE INFORMATION ON FOLLOWING PAGE.

Appendix

Curriculum Code

T	0	1	1
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Survey No.

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PLEASE PROVIDE THE FOLLOWING INFORMATION

1) Are you a:

- ☐ Golf Course Manager
- ☐ Golf Course Superintendent
- ☐ Assistant Golf Course Superintendent
- ☐ Golf Course Greenskeeper
- ☐ Golf Course Foreman
- ☐ Golf Course Mechanic
- ☐ Golf Course Employee
- ☐ Other _____

☐

2) Number of years experience in golf course work:

- ☐ 0-4 years
- ☐ 5-8 years
- ☐ 9-12 years
- ☐ 13-16 years
- ☐ 17-20 years
- ☐ More than 20 years

☐

3) The golf course where I am presently employed is located:

- ☐ Rural Area
- ☐ In or near town or city, population:
- ☐ 1,000 - 15,000
- ☐ 16,000 - 30,000
- ☐ 31,000 - 45,000
- ☐ 46,000 - 60,000
- ☐ 61,000 - 75,000
- ☐ 76,000 - 90,000
- ☐ 91,000 - 105,000
- ☐ More than 105,000

☐

4) Total number of employees at this golf course:

- ☐ 1-3
- ☐ 4-6
- ☐ 7-9
- ☐ 10-12
- ☐ More than 12

☐

If you would like to serve on the committee to assist personally in developing the project, please complete the form on the following page and return it with this task inventory.

Interest Survey

Appendix

Yes, I would be interested in serving on the committee to assist in developing the project.

NAME _____

ADDRESS _____

TELEPHONE _____

APPENDIX C-3
TASK VALIDATION RESULTS

APPENDIX C-3		CURRICULUM CODE NO. & TITLE T-011 Recreational Grounds Management Technology																
TASK VALIDATION RESULTS		Total No. Responses	MEAN						FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)									
Or'g. No.	Rank		TASKS	()	Group	Emplr's (N)	Empl'ye's (N)	Educ's (N)	1		2		3		4		5	
									(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.
67	1	Calibrate sprayers and apply pesticides, herbicides, etc.	71	4.48	4.5	(60)	4.36	(11)	4	5.6	1	1.4	3	4.2	12	16.9	51	71.8
66	2	Select and mix insecticides, fungicides and herbicides for prevention or control.	72	4.47	4.47	(60)	4.5	(12)	4	5.5	1	1.4	5	6.9	9	12.5	53	73.6
42	3	Mix and apply pesticides to new plantings.	72	4.42	4.47	(60)	4.17	(12)	2	2.8	2	2.8	7	9.7	14	19.4	47	65.3
53	4	Apply fertilizer and lime according to soil test results.	72	4.40	4.45	(60)	4.17	(12)	3	4.2	0	0	7	9.7	7	9.7	45	62.5
153	5	Set mowing heights and adjust reels to bedknife.	70	4.40	4.34	(59)	4.73	(11)	3	4.3	1	1.4	6	8.6	15	21.4	45	64.3
170	6	Keep records of fertilizers, lime and pesticides applied.	69	4.36	4.40	(58)	4.18	(11)	3	4.3	0	0	4	5.8	24	34.8	38	55.1
43	7	Develop and prescribe mowing patterns, height of cut, type of mower and frequency of mowing.	71	4.35	4.32	(59)	4.5	(12)	4	5.6	0	0	8	11.3	14	19.7	45	63.4
59	8	Develop renovation, verticutting and/or topdressing programs.	72	4.33	4.33	(60)	4.33	(12)	4	5.5	2	2.8	4	5.5	18	25	44	61.1
65	9	Obtain a commercial pesticide applicators license.	72	4.32	4.35	(60)	4.17	(12)	6	8.3	1	1.4	7	9.7	8	11.1	50	69.4
60	10	Overseed and reseed turf.	72	4.31	4.28	(60)	4.42	(12)	3	4.2	0	0	12	16.7	14	19.4	43	59.7
211	11	Be aware of how and where to find current information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.	69	4.3	4.33	(58)	4.18	(11)	4	5.8	0	0	2	2.9	28	40.5	35	50.7
155	12	Change and set nozzles on spray equipment.	70	4.3	4.32	(59)	4.18	(11)	3	4.3	0	0	10	14.3	17	24.3	40	58
54	13	Aerify, slice and spike turf.	72	4.29	4.3	(60)	4.25	(12)	3	4.2	1	1.4	9	12.5	18	25	41	56.9
194	14	Supervise employees	69	4.29	4.36	(58)	3.91	(11)	3	4.3	3	4.3	5	7.2	18	26.1	40	57
45	15	Develop annual fertilization and liming programs.	72	4.28	4.33	(60)	4	(12)	4	5.6	2	2.8	6	8.3	18	25	42	58
209	16	Determine when facility should be opened and closed due to inclement weather.	69	4.28	4.35	(58)	3.91	(11)	4	5.8	1	1.4	2	2.9	27	39.1	35	50.7
152	17	Sacklap reels.	70	4.27	4.2	(59)	4.64	(11)	2	2.9	3	4.3	8	11.4	18	25.7	39	55.7
98	18	Develop annual fertilization and liming programs.	71	4.27	4.27	(60)	4.27	(11)	3	4.2	2	2.8	4	5.6	26	36.6	36	50.7

63

64

Orig. No.	Rank	TASKS	Total No. Responses	MEAN				FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)									
								1		2		3		4		5	
				Group	Emplr's (N)	Empl'e's (N)	Educ's (N)	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.
34	19	Apply fertilizer and lime.	72	4.26	4.27 (60)	4.25 (12)		3	4.2	2	2.8	8	1.1	19	26.4	40	55.6
107	20	Mix and apply proper pesticides and herbicides to control or prevent insects, diseases and weeds.	71	4.25	4.27 (60)	4.18 (11)		3	4.2	2	2.8	10	14.1	15	21.1	41	57.7
46	21	Calibrate spreaders and keep records of settings.	72	4.25	4.35 (60)	3.75 (12)		4	5.6	4	5.6	7	9.7	12	16.7	45	62.5
48	21	Irrigate turf.	72	4.25	4.28 (60)	4.08 (12)		3	4.2	3	4.2	9	12.5	15	20.8	42	58.3
200	23	Enforce safety regulations.	69	4.25	4.28 (58)	4.09 (11)		4	5.8	0	0	4	5.8	28	41.0	33	47.8
193	23	Train new employees.	69	4.25	4.26 (58)	4.18 (11)		2	2.9	3	4.3	5	7.2	25	36.2	34	49.3
100	25	Apply fertilizer and lime according to soil test results.	71	4.24	4.25 (60)	4.18 (11)		3	4.2	3	4.2	7	9.9	19	26.7	39	54.9
44	26	Mow greens, collars, aprons and tees.	72	4.24	4.22 (60)	4.33 (12)		3	4.2	3	4.2	9	12.5	16	22.2	41	56.9
61	26	Report pest problems.	72	4.24	4.18 (60)	4.5 (12)		3	4.2	2	2.8	11	15.3	15	20.8	41	56.9
207	28	Keep golfers informed of problems, changes and/or additions to courses.	69	4.23	4.24 (58)	4.18 (11)		3	4.3	2	2.9	5	7.2	25	36.2	34	49.3
169	29	Keep records of receipts and expenses.	67	4.21	4.2 (56)	4.27 (11)		3	4.5	3	4.5	4	6	24	35.8	33	49.3
49	30	Relocate and replace cups.	72	4.21	4.22 (60)	4.17 (12)		3	4.2	4	5.6	12	16.7	9	12.5	44	61.1
62	30	Identify insects, diseases and weeds which commonly infest turf areas.	72	4.21	4.18 (60)	4.33 (12)		4	5.6	3	4.2	5	6.9	22	30.6	38	52.8
79	32	Apply fertilizer, lime and/or other soil amendments.	70	4.2	4.19 (59)	4.27 (11)		3	4.3	3	4.3	8	11.4	19	27.1	37	52.9
90	33	Select and apply proper preventive or curative measures for pests, diseases and weeds.	71	4.2	4.2 (60)	4.18 (11)		4	5.6	2	2.8	6	8.5	23	32.4	36	50.7
168	34	Keep employee time records.	69	4.17	4.16 (58)	4.27 (11)		3	4.3	2	2.9	9	13	21	30.4	34	49.3
195	34	Evaluate employee performance	69	4.17	4.24 (58)	3.82 (11)		3	4.3	2	2.9	8	11.6	23	33.3	33	47.8
196	34	Recommend personnel actions such as promoting, firing, disciplinary action.	69	4.17	4.28 (58)	3.64 (11)		4	5.8	2	2.9	4	5.8	27	39.1	32	46.4
197	34	Identify equipment and supply needs.	69	4.17	4.17 (58)	4.18 (11)		3	4.3	2	2.9	5	7.2	29	42	30	43.5
192	38	Designate and prepare work schedules for employees.	69	4.16	4.21 (58)	3.91 (11)		3	4.3	3	4.3	5	7.2	27	39.1	31	44.9
154	39	Change reels and verticut units on triplex mowers.	70	4.16	4.1 (59)	4.46 (11)		4	5.7	2	2.9	10	14.3	17	24.3	37	52.9

CURRICULUM CODE NO. & TITLE T-011 Recreational Grounds Management Technology																					
Orig. No.	Rank	TASKS	Total No. Responses	MEAN					FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)												
				Group	Emplr's (N)	Emplee's (N)	(N)	1 (N) Pct.	2 (N) Pct.	3 (N) Pct.	4 (N) Pct.	5 (N) Pct.									
89	40	Identify pests, diseases and weeds.	71	4.14	4.15	(60)	4.09	(11)	4	5.6	1	1.4	8	11.3	26	36.6	32	45.1			
23	41	Calibrate spreaders and compute total amount of lime and/or fertilizer required in seedbed preparation.	72	4.14	4.23	(60)	3.67	(12)	5	6.9	1	1.4	10	13.9	19	26.4	37	51.4			
47	42	Develop irrigation programs and set automatic controllers.	71	4.13	4.27	(60)	3.36	(11)	7	9.9	1	1.4	7	9.9	17	23.9	39	54.9			
40	43	Fertilize new plantings.	72	4.13	4.2	(60)	3.75	(12)	4	5.6	1	1.4	10	13.9	24	33.3	33	45.8			
96	44	Develop and prescribe mowing patterns, height of cut, type of mower and frequency of mowing.	70	4.11	4.09	(59)	4.27	(11)	4	5.7	1	1.4	12	17.1	19	27.1	34	48.6			
157	44	Check and change belts and chain drivers in power-driven turf equipment.	70	4.11	4.07	(59)	4.36	(11)	3	4.3	0	0	13	18.6	24	34.3	30	42.9			
189	46	Understand and comply with OSHA and EPA regulations.	68	4.1	4.05	(57)	4.36	(11)	3	4.4	2	2.9	11	16.2	21	30.9	31	45.6			
24	47	Select and determine amount of seed, sprigs or sod required in establishment.	72	4.1	4.13	(60)	3.92	(12)	3	4.2	2	2.8	12	16.7	23	31.9	32	44.4			
36	47	Sow seed, sprig, stolonize, plug or sod.	72	4.1	4.15	(60)	3.83	(12)	4	5.6	2	2.8	10	13.9	23	31.9	33	45.8			
191	49	Recruit, interview and select employees.	69	4.09	4.21	(58)	3.46	(11)	4	5.8	3	4.3	6	8.7	26	37.7	30	43.5			
156	50	Check and change oil in motors on power-driven turf equipment.	70	4.09	4	(59)	4.55	(11)	3	4.3	3	4.3	15	21.4	13	18.6	36	51.4			
99	51	Calibrate spreaders and keep records of settings.	71	4.07	4.1	(60)	3.91	(11)	4	5.6	5	7	8	11.3	19	26.8	35	49.3			
50	52	Relocate and replace tee markers.	72	4.07	4.12	(60)	3.83	(12)	4	5.6	4	5.6	14	19.4	11	15.3	39	54.2			
190	53	Identify labor needs.	69	4.06	4.07	(58)	4	(11)	3	4.3	2	2.9	10	14.5	27	39.1	27	39.1			
208	53	Have a good knowledge of playing golf.	69	4.06	4.1	(58)	3.82	(11)	2	2.9	1	1.4	14	20.3	26	37.7	26	37.7			
137	55	Apply appropriate control measures.	70	4.06	4.1	(59)	3.82	(11)	2	2.9	2	2.9	15	21.4	22	31.4	29	41.4			
162	55	Replace tines and blades on areators, verticutters, slicers and spikers.	70	4.06	4.05	(59)	4.09	(11)	3	4.3	2	2.9	14	20	20	28.6	31	44.3			
185	55	Order replacement and/or new merchandise.	70	4.06	4.07	(59)	4	(11)	3	4.3	4	5.7	10	14.3	22	31.4	31	44.3			
58	58	Mix and apply topdressing material.	71	4.06	4	(59)	4.33	(12)	4	5.6	4	5.6	9	12.7	21	29.6	33	46.5			
39	59	Irrigate new plantings.	72	4.06	4.03	(60)	4.17	(12)	3	4.2	4	5.6	11	15.3	22	30.6	32	44.4			
136	60	Determine methods of control needed to eradicate weeds, pests and diseases.	70	4.04	4.07	(59)	3.91	(11)	3	4.3	1	1.4	16	22.9	20	28.6	30	42.9			
67																				68	

CURRICULUM CODE NO. & TITLE T-011 Recreational Grounds Management Technology																			
Orig. No.	Rank	TASKS	Total No. Responses ()	MEAN				FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)											
				Group	Emplr's (N)		Educ's (N)	1		2		3		4		5			
					(N)	Pct.		(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.		
158	60	Grease power-driven turf equipment.	70	4.04	3.97	(59)	4.46	(11)		3	4.3	5	7.1	11	15.7	18	25.7	33	47.1
199	62	Order or purchase equipment, supplies, etc.	69	4.03	4.1	(58)	3.64	(11)		4	5.8	3	4.3	10	14.5	22	31.9	30	43.5
135	63	Identify pests, diseases and weeds.	70	4.03	4.05	(59)	3.91	(11)		2	2.9	2	2.9	18	25.7	18	25.7	30	42.9
41	64	Mow new plantings.	72	4.03	4.1	(60)	3.67	(12)		3	4.2	2	2.8	16	22.2	20	27.8	31	43.1
171	65	Keep records of gasoline usage.	69	4.01	4.05	(58)	3.82	(11)		3	4.3	3	4.3	14	20.3	19	27.5	30	43.5
151	66	Grind and sharpen mower blades.	70	4.01	4.05	(59)	3.82	(11)		3	4.3	2	2.9	15	21.4	21	30	29	41.4
122	67	Apply fertilizer and lime according to soil test results.	71	4.01	4	(60)	4.09	(11)		3	4.2	3	4.2	12	16.9	25	35.2	28	39.4
56	68	Verticut and remove verticut debris from turf.	72	4	3.97	(60)	4.17	(12)		4	5.6	3	4.2	17	23.6	13	18.1	35	48.6
104	69	Re-establish turf by seeding, sprigging or sodding.	71	3.99	3.98	(60)	4	(11)		3	4.2	2	2.8	15	21.1	24	33.8	27	38
149	70	Clean hand tools and equipment.	70	3.99	3.92	(59)	4.36	(11)		4	5.7	3	4.3	11	15.7	24	34.3	28	40
82 179	71	Keep maintenance and repair records on equipment.	69	3.99	4.03	(58)	3.73	(11)		4	5.8	4	5.8	9	13	24	34.8	28	41
97	72	Mow fairways and roughs.	71	3.97	3.95	(60)	4.09	(11)		3	4.2	3	4.2	18	25.4	16	22.5	31	43.7
106	72	Repair worn areas.	71	3.97	3.98	(60)	3.91	(11)		3	4.2	3	4.2	14	19.7	24	33.8	27	38
164	74	Read and interpret owner's manual for ordering parts.	69	3.97	3.93	(58)	4.18	(11)		4	5.8	2	2.9	14	20.3	21	30.4	28	41
198	74	Identify and select producers and suppliers of plants, equipment, supplies, etc.	69	3.97	4.07	(58)	3.46	(11)		4	5.8	3	4.3	7	10.1	32	46.4	23	33.3
35	76	Mix seed.	72	3.96	4.07	(60)	3.42	(12)		6	8.3	2	2.8	13	18.1	19	26.4	32	44.4
93	77	Fertilize newly planted turf, trees and shrubs.	71	3.96	4.1	(60)	3.18	(11)		4	5.6	2	2.8	16	22.5	20	28.2	29	40.8
105	77	Repair irrigation and drainage systems.	71	3.96	4.02	(60)	3.64	(11)		4	5.6	3	4.2	10	14.1	29	40.8	25	35.2
94	79	Mow newly planted turf grasses.	70	3.96	4.02	(59)	3.64	(11)		3	4.3	4	5.7	17	24.3	15	21.4	31	44.3
32	80	Select planting dates.	72	3.94	4.07	(60)	3.33	(12)		6	8.3	2	2.8	7	9.7	32	44.4	25	34.7
73	80	Determine total amount of amendments, fertilizers and/or lime needs on an acreage basis.	72	3.94	4.05	(60)	3.42	(12)		5	6.9	1	1.4	13	18.1	27	37.5	26	36.1
159	82	Check and change air filters in power-driven turf equipment.	69	3.94	3.91	(58)	4.09	(11)		3	4.3	6	8.7	14	20.3	15	21.7	31	44.9

Orig. No.	Rank	TASKS	Total No. Responses	MEAN				FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)									
				Group	Emplr's (N)	Emplye's (N)	Educ's (N)	1		2		3		4		5	
								(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.
88	83	Seed or sprig fairways and roughs at proper time.	71	3.93	3.95 (60)	3.82 (11)		5	7	3	4.2	12	16.9	23	32.4	28	39.4
161	84	Check, refill and charge batteries.	70	3.93	3.86 (59)	4.27 (11)		2	2.9	7	10	16	22.9	14	20	31	44.3
181	84	Check received merchandise against invoice listings.	70	3.93	3.93 (59)	3.91 (11)		5	7.1	3	4.3	13	18.6	20	28.6	29	41.4
210	86	Be familiar with various professional and trade associations and make decision about membership in these organizations.	69	3.93	4.03 (58)	3.36 (11)		5	7.2	2	2.9	9	13	30	43.5	23	33.3
166	87	Prepare annual maintenance program for signs, ball washers, bridges, tee markers, benches, water fountains and trash baskets.	70	3.91	3.93 (59)	3.82 (11)		2	2.9	6	8.6	13	18.6	24	34.3	25	35.7
63	88	Use professional or governmental agencies to identify unusual pests and make recommendations.	71	3.9	3.98 (59)	3.5 (12)		6	8.5	3	4.2	13	18.3	19	26.8	30	42.3
92	89	Irrigate newly planted turf, trees and shrubs.	71	3.89	3.97 (60)	3.46 (11)		4	5.6	3	4.2	18	25.4	18	25.4	28	39.4
69 148	90	Keep work and storage areas neat and clean.	70	3.89	3.83 (59)	4.18 (11)		3	4.3	4	5.7	16	22.9	22	31.4	25	35.7
160	90	Check tires and tire pressure.	70	3.89	3.81 (59)	4.27 (11)		3	4.3	9	12.9	13	18.6	13	18.6	32	45.7
165	90	Tune-up vehicles and equipment by replacement of spark plugs and points.	70	3.89	3.88 (59)	3.91 (11)		2	2.9	4	5.7	18	25.7	22	31.4	24	34.3
212	93	Have knowledge of and subscribe to various professional and trade publications.	69	3.88	4 (58)	3.27 (11)		6	8.7	2	2.9	8	11.6	22	31.9	22	31.9
18	94	Determine square footage.	72	3.88	3.93 (60)	3.58 (12)		6	8.3	4	5.6	16	22.2	13	18.1	33	45.8
95	95	Set boundaries on fairways.	63	3.87	3.96 (53)	3.4 (10)		3	4.8	3	4.8	13	20.6	24	38.1	20	31.7
74	96	Determine amount of seed or sprigs for acreage.	70	3.87	3.88 (59)	3.82 (11)		5	7.1	4	5.7	9	12.9	29	41.4	23	32.9
163	96	Maintain and repair small gasoline engines.	70	3.87	3.83 (59)	4.09 (11)		2	2.9	3	4.3	16	22.9	30	42.9	19	27.1
178	98	Develop adequate record system for ordering and restocking plants, materials, supplies, repair parts, etc.	69	3.87	3.9 (58)	3.73 (11)		5	7.2	3	4.3	12	17.4	25	36.2	24	34.8
20	99	Take soil samples for physical and chemical analysis.	72	3.86	3.92 (60)	3.58 (12)		5	6.9	4	5.6	19	26.4	12	16.7	32	44.4
30	99	Plan and install drainage system.	72	3.86	3.93 (60)	3.5 (12)		5	6.9	5	6.9	11	15.3	25	34.7	26	36.1
180	101	Keep current inventory of supplies, repair parts, oil and grease, seed, fertilizers, lime, pesticides, etc.	70	3.86	3.9 (59)	3.64 (11)		4	5.7	3	4.3	13	18.6	29	41.4	21	30

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				Group	Emplr's (N)	Emplee's (N)	Educ's (N)	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.			
184	101	Store received merchandise.	70	3.86	3.81	(59)	4.09	(11)		3	4.3	5	7.1	15	21.4	23	32.9	24	34.3	
206	103	Prepare annual budgets.	69	3.86	4	(58)	3.09	(11)		8	11.6	4	5.8	8	11.6	19	27.5	30	43.5	
51	104	Repair divots.	72	3.85	3.92	(60)	3.5	(12)		7	9.7	7	9.7	10	13.9	14	19.4	34	47.2	
57	104	Sterilize topdressing material.	72	3.85	3.83	(60)	3.92	(12)		6	8.3	5	6.9	12	16.7	20	27.8	29	40.3	
87	106	Dig out sand traps, install drainage and select and add sand.	71	3.85	3.82	(60)	4	(11)		4	5.6	4	5.6	13	18.3	28	39.4	22	31	
101	106	Develop irrigation programs and set automatic controllers.	71	3.85	3.95	(60)	3.27	(11)		6	8.5	4	5.6	11	15.5	24	33.8	26	36.6	
102	106	Irrigate established fairways.	71	3.85	3.97	(60)	3.18	(11)		6	8.5	4	5.6	14	19.7	18	25.4	29	40.8	
103	109	Develop program to re-establish fairways, rough and sand traps.	70	3.84	3.92	(59)	3.46	(11)		4	5.7	4	5.7	13	18.6	27	38.6	22	31.4	
167	109	Maintain, clean and repair, when appropriate, signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets.	70	3.84	3.81	(59)	4	(11)		3	4.3	4	5.7	19	27.1	19	27.1	25	35.7	
70	59	111	Distribute topdressing with dragmat.	71	3.83	3.83	(59)	3.83	(12)		5	7	6	8.5	14	19.7	17	23.9	29	40.8
13	112	Have knowledge of cultural requirements of plants (light, soil, temperature, shade, etc.).	72	3.82	3.8	(60)	3.92	(12)		5	6.9	5	6.9	12	16.7	26	36.1	24	33.3	
150	113	Sharpen hand tools.	70	3.79	3.76	(59)	3.91	(11)		2	2.9	5	7.1	19	27.1	24	34.3	20	28.6	
182	113	Take annual inventory for tax purposes.	70	3.79	3.88	(59)	3.27	(11)		8	11.4	3	4.3	12	17.1	20	28.6	27	38.6	
187	115	Order repair parts for business vehicles and equipment.	70	3.77	3.8	(59)	3.64	(11)		5	7.1	5	7.1	16	22.9	19	27.1	25	35.7	
55	116	Remove plugs.	72	3.76	3.82	(60)	3.5	(12)		3	4.2	9	12.5	17	23.6	16	22.2	27	37.5	
138	117	Rope off and direct traffic.	70	3.76	3.8	(59)	3.55	(11)		1	1.4	6	8.6	24	34.3	17	24.3	22	31.4	
183	117	Check invoices for math errors.	70	3.76	3.78	(59)	3.64	(11)		7	10	3	4.3	14	20	22	31.4	24	34.3	
188	119	Understand and comply with business laws.	69	3.75	3.71	(58)	4	(11)		2	2.9	8	11.6	15	21.7	24	34.8	20	28.9	
82	120	Plan and install drainage system.	71	3.73	3.73	(60)	3.73	(11)		6	8.5	7	9.9	10	14.1	25	35.2	23	32.4	
109	120	Add sand to traps.	71	3.73	3.77	(60)	3.55	(11)		4	5.6	7	9.9	20	28.2	13	18.3	27	38	
25	122	Select and determine amount of mulch material required.	72	3.72	3.77	(60)	3.5	(12)		6	8.3	4	5.6	17	23.6	22	30.6	23	31.9	
139	123	Stake and/or provide protection for injured trees, newly transplanted trees, etc.	70	3.7	3.7	(59)	3.73	(11)		1	1.4	8	11.4	20	28.6	23	32.9	18	25.7	

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				Group	Emplr's (N)	Emplee's (N)	Educ's (N)	1		2		3		4		5		
								(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.	
21	124	Interpret physical and chemical analysis of soils and make recommendations.	71	3.69	3.73 (60)	3.46 (11)		5	7	8	11.3	14	19.7	21	29.6	23	32.4	
120	125	Take soil test and interpret results.	70	3.69	3.72 (60)	3.5 (10)		6	8.6	5	7.1	15	21.4	23	32.9	21	30	
33	126	Level and sterilize seedbed.	72	3.68	3.75 (60)	3.33 (12)		6	8.3	5	6.9	15	20.8	26	36.1	20	27.8	
76	127	Designate equipment and steps to be used in land preparation.	70	3.67	3.75 (59)	3.27 (11)		6	8.6	6	8.6	12	17.1	27	38.6	19	27.1	
108	128	Rake sand traps.	71	3.66	3.7 (60)	3.46 (11)		6	8.5	5	7	22	31	12	16.9	26	36.6	
112	128	Overseed fairways.	71	3.66	3.68 (60)	3.55 (11)		6	8.5	4	5.6	19	26.8	21	29.6	21	29.6	
201	130	Establish employee wages, hours and working conditions.	69	3.65	3.9 (58)	2.36 (11)		9	13	5	7.2	7	10.1	28	41	20	28.9	
83	131	Level and smooth land preparatory to planting.	71	3.65	3.65 (60)	3.64 (11)		5	7	2	2.8	25	35.2	20	28.2	19	26.8	
110	132	Trim and edge sand traps.	71	3.63	3.68 (60)	3.36 (11)		6	8.5	6	8.5	22	31	11	15.5	26	36.6	
84	133	Stabilize steep banks.	70	3.63	3.65 (60)	3.5 (10)		7	10	0	0	20	28.6	28	40	15	21.4	
91	134	Plant and/or transplant trees and shrubs.	71	3.62	3.63 (60)	3.55 (11)		2	2.8	6	8.5	21	29.6	30	42.3	12	16.9	
72	135	Take soil test and interpret results.	71	3.61	3.7 (60)	3.09 (11)		8	11.3	4	5.6	16	22.5	23	32.4	20	28.2	
68	136	Take nematode assays.	71	3.59	3.53 (60)	3.91 (11)		8	11.3	2	2.8	18	25.4	26	36.6	17	23.9	
26	137	Remove trees and debris.	72	3.58	3.62 (60)	3.42 (12)		5	6.9	8	11.1	20	27.8	18	25	21	29.2	
37	137	Roll after planting.	72	3.58	3.6 (60)	3.5 (12)		5	6.9	8	11.1	19	26.4	20	27.8	20	27.8	
71	137	Compute acreage.	72	3.58	3.6 (60)	3.5 (12)		7	9.7	6	8.3	17	23.6	22	30.6	20	27.8	
78	140	Plow, disk, rake or otherwise prepare land.	70	3.57	3.58 (59)	3.55 (11)		4	5.7	5	7.1	28	40	13	18.6	20	28.6	
177	141	File records and other materials.	69	3.57	3.6 (58)	3.36 (11)		5	7.2	9	13	11	15.9	30	43.5	14	20.3	
64	142	Obtain, package and mail samples of pests to be identified.	72	3.56	3.67 (60)	3 (12)		11	15.3	4	5.6	13	18.1	22	30.6	22	30.6	
124	143	Plant trees and shrubs around clubhouse, entrance and other prescribed areas.	71	3.55	3.63 (60)	3.09 (11)		3	4.2	8	11.3	23	32.4	21	29.6	16	22.5	
77	144	Remove trees and debris.	71	3.54	3.48 (60)	3.82 (11)		4	5.6	8	11.3	22	31	20	28.2	17	23.9	
126	144	Prune and trim trees and shrubs at correct time using proper equipment and methods.	71	3.54	3.58 (60)	3.27 (11)		5	7	6	8.5	20	28.2	26	36.6	14	19.7	

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				Group	Emplr's (N)	Emplee's (N)	Educ's (N)	1		2		3		4		5		
								(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.	
27	146	Plow, disk and rake area.	72	3.51	3.62	(60)	3	(12)	5	6.9	9	12.5	22	30.6	16	22.2	20	27.8
172	147	Keep daily and yearly rainfall and weather records.	69	3.51	3.57	(58)	3.18	(11)	6	8.7	8	11.6	17	24.6	21	30.4	17	24.6
12	148	Use resource material to identify unknown plants which cannot be identified by visual inspection.	72	3.5	3.48	(60)	3.58	(12)	6	8.3	12	16.7	11	15.3	26	36.1	17	23.6
85	149	Compute sand requirements for traps on a tonnage or yardage basis.	71	3.49	3.48	(60)	3.55	(11)	6	8.5	7	9.9	21	29.6	20	28.2	17	23.9
123	149	Prepare seedbeds for flowers, other annuals, bulbs, etc.	71	3.49	3.57	(60)	3.09	(11)	6	8.5	7	9.9	20	28.2	22	31	16	22.5
38	151	Apply mulching materials.	72	3.49	3.58	(60)	3	(12)	7	9.7	8	11.1	16	22.2	25	34.7	16	22.2
118	152	Prepare annual maintenance program for trees, shrubs, and other ornamentals.	71	3.48	3.53	(60)	3.18	(11)	5	7	8	11.3	21	29.6	22	31	15	21.1
72	153	Identify selected species of plants by common and scientific name (grasses, ornamentals, perennials, trees, etc.).	72	3.47	3.4	(60)	3.83	(12)	4	5.6	7	9.7	27	37.5	19	26.4	15	20.8
28	153	Lay out an irrigation system for tees and greens.	72	3.47	3.48	(60)	3.42	(12)	5	6.9	7	9.7	25	34.7	19	26.4	16	22.2
80	155	Lay out irrigation system for fairways.	71	3.47	3.45	(60)	3.55	(11)	7	9.9	10	14.1	18	25.4	15	21.1	21	29.6
29	156	Install irrigation system.	72	3.46	3.48	(60)	3.33	(12)	7	9.7	6	8.3	20	27.8	25	34.7	14	19.4
86	157	Select location for green and fairway traps.	71	3.44	3.52	(60)	3	(11)	6	8.5	8	11.3	21	29.6	21	29.6	15	21.1
173	158	Prepare employee payroll.	69	3.44	3.62	(58)	2.46	(11)	11	15.9	10	14.5	10	14.5	14	20.3	24	34.8
19	159	Compute tonnage and yardage of materials to be used in constructing a green or tee.	70	3.43	3.43	(60)	3.4	(10)	7	10	13	18.6	14	20	15	21.4	21	30
134	159	Repair cart paths.	70	3.43	3.37	(59)	3.73	(11)	2	2.9	8	11.4	29	41.4	20	28.6	11	15.7
186	161	Arrange for transportation of materials purchased.	70	3.41	3.48	(59)	3.09	(11)	8	11.4	6	8.6	19	27.1	23	32.9	14	20
81	162	Install irrigation system.	71	3.41	3.67	(60)	3.64	(11)	9	12.7	6	8.5	20	28.2	19	26.8	17	23.9
127	162	Remove and/or relocate trees and shrubs.	71	3.41	3.47	(60)	3.09	(11)	3	4.2	11	15.5	22	31	24	33.8	11	15.5
141	164	Construct and maintain fences using different types of materials.	69	3.41	3.45	(58)	3.18	(11)	4	5.8	9	12.8	22	31.9	23	33.3	11	15.9
119	165	Prepare annual maintenance program for lakes and ponds.	71	3.39	3.5	(60)	2.82	(11)	7	9.9	5	7	23	32.4	25	35.2	11	15.5

Orig. No.	Rank	TASKS	Total No. Responses ()	MEAN				FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)									
				Group	Emplr's (N)		Educ's (N)	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.	(N)	Pct.
125	165	Plant annuals, bulbs, etc. in prescribed areas.	71	3.39	3.5	(60)	2.82	(11)		4	5.6	12	16.9	22	31	18	25.4
128	165	Mow and edge lake banks and water hazards.	71	3.39	3.43	(60)	3.18	(11)		5	7	9	12.7	24	33.8	19	26.8
31	168	Estimate cost of materials, manhours, equipment use, etc. for establishing tees and greens.	72	3.39	3.52	(60)	2.75	(12)		10	13.9	5	6.9	21	29.2	19	26.4
75	169	Compute amount of mulching material for acreage.	70	3.37	3.46	(59)	2.91	(11)		6	8.6	7	10	22	31.4	25	35.7
121	170	Dig holes for planting trees and shrubs.	71	3.37	3.38	(60)	3.27	(11)		4	5.6	13	18.3	22	31	17	23.9
142	171	Construct and maintain retaining walls using railroad ties, block, brick, rock or other materials.	69	3.36	3.43	(58)	3	(11)		4	5.8	8	11.6	27	39.1	19	27.5
111	172	Take nematode assay.	71	3.34	3.35	(60)	3.27	(11)		10	14.1	5	7	22	31	19	26.8
143	173	Construct walks and drives.	69	3.33	3.41	(58)	2.91	(11)		4	5.8	9	13	27	39.1	18	26.1
69	174	Read and interpret blueprints and plans.	72	3.31	3.32	(60)	3.25	(12)		8	11.1	11	15.3	20	27.8	17	23.6
145	175	Construct benches.	69	3.23	3.29	(58)	2.91	(11)		4	5.8	10	14.5	29	42	18	26.1
174	175	Assist in records audit.	69	3.23	3.4	(58)	2.36	(11)		13	18.8	4	5.8	19	27.5	20	28.9
176	177	Keep annual depreciation schedule.	69	3.19	3.33	(58)	2.46	(11)		9	13	14	20.3	15	21.7	17	24.6
22	178	Mix and transport media.	71	3.18	3.27	(59)	2.75	(12)		5	7	10	14.1	29	40.8	21	29.6
140	179	Install edging material.	70	3.17	3.17	(59)	3.18	(11)		6	8.6	14	20	23	32.9	16	22.9
70	180	Design and prepare scaled drawings of proposed changes and/or additions to plans to include trees and shrubs.	72	3.17	3.17	(60)	3.17	(12)		10	13.9	7	9.7	28	38.9	15	20.8
133	181	Propagate different types of plants at the correct time using proper techniques and procedures.	70	3.14	3.12	(59)	3.27	(11)		4	5.7	14	20	27	38.6	18	25.7
202	182	Administer social security and other employee benefit programs.	69	3.13	3.31	(58)	2.18	(11)		13	18.8	12	17.4	12	17.4	17	24.6
205	183	Locate sources of and secure credit.	69	3.12	3.31	(58)	2.09	(11)		14	20.3	11	15.9	14	20.3	13	18.8
129	184	Select propagating stock.	71	3.1	3.13	(60)	2.91	(11)		6	8.5	16	22.5	24	33.8	15	21.1
117	185	Develop landscape design for clubhouse, entrance and other prescribed areas.	70	3.09	3.05	(59)	3.27	(11)		9	12.9	12	17.1	23	32.9	16	22.9

APPENDIX D

COMPETENCIES, CRITERION MEASURES - RECREATIONAL GROUNDS MANAGEMENT TECHNOLOGY

SUBJECT AREA: Plant Identification and Cultural Require- ments

- TASK # A11:** Identify selected species of plants by common and scientific name (grasses, ornamentals, perennials, trees, etc.)
- COMPETENCY:** Correctly identify plants by their common and scientific names and correctly spell the common and scientific names of identified plants.
- CRITERION MEASURE:**
1. Selected plants are correctly identified by common and scientific names.
 2. Common and scientific names of selected plants are spelled correctly.
-
- TASK # A12:** Use resource material to identify unknown plants which cannot be identified by visual inspection.
- COMPETENCY:** Correctly identify selected plants by their common and scientific names by using resource materials.
- CRITERION MEASURE:** Selected plants are correctly identified by their common and scientific names using resource materials.
-
- TASK # A13:** Have knowledge of cultural requirements of plants (light, soil, temperature, shade, etc.).
- COMPETENCY:** Identify the cultural requirements of selected plants.
- CRITERION MEASURE:** Cultural requirements of selected plants are correctly identified.

Appendix

SUBJECT AREA: Establishment of
Greens and Tees

- TASK # B14:** Read and interpret architectural designs.
- COMPETENCY:** Identify and interpret architectural symbols and design principles.
- CRITERION MEASURE:** Architectural symbols and design principles are read and interpreted correctly.
-
- TASK # B15:** Set and check grades.
- COMPETENCY:** Set stakes for cut and fill for proper slope and drainage, utilizing proper techniques in elementary surveying.
- CRITERION MEASURE:**
1. All stakes are set to specifications for cut and fill for proper slope and drainage.
 2. Exact locations are recorded in field notebook.
-
- TASK # B16:** Design and prepare scale drawings of proposed changes and/or additions.
- COMPETENCY:** Prepare scale designs for changes and additions to original plans.
- CRITERION MEASURE:**
1. Design is to scale and is read or interpreted correctly.
 2. Design follows set standards.
-
- TASK # B17:** Construct and read topographic maps from field data.
- COMPETENCY:**
1. Assemble information for future reference, using maps for finding slope and specialized topographic features.
 2. Construct topographic maps from specified data.
- CRITERION MEASURE:**
1. Topographic maps are read and interpreted correctly.
 2. Topographic maps are constructed from given data following specified procedures.

Appendix

SUBJECT AREA: Establishment of
Greens and Tees

- TASK # B18:** Determine square footage.
- COMPETENCY:** Determine the amount of square footage for specified greens and tees.
- CRITERION MEASURE:** The square footage for specified greens and tees is accurately computed.
-
- TASK # B19:** Compute tonnage and yardage of materials to be used in constructing a green or tee.
- COMPETENCY:** Collect needed data to determine tonnage and cubic yards of construction materials to be used in establishing greens and tees.
- CRITERION MEASURE:**
1. Correct information is derived from dependable data in constructing greens and tees.
 2. Tonnage and cubic yards of all materials are computed accurately.
-
- TASK # B20:** Take soil samples for physical and chemical analysis.
- COMPETENCY:** Take soil samples according to established procedures, fill out information sheets, and submit samples to a soil testing laboratory.
- CRITERION MEASURE:**
1. Soil samples are taken according to established and approved procedures.
 2. Information sheets are completed giving information on land use and fertilization and hiring records.
 3. Soil samples and information sheets are mailed to state or private soil testing laboratories.

Appendix

SUBJECT AREA: Establishment of
Greens and Tees

TASK # B21: Interpret physical and chemical analysis of soils and make recommendations.

COMPETENCY: Read soil test results, interpret the analysis, and determine the amounts and types of fertilizer and lime to use based on the test results.

CRITERION MEASURE:

1. Soil test results are read and interpreted correctly.
2. The amounts and types of fertilizer and lime to use are correctly determined based on test results.

TASK # B22: Mix and transport media.

COMPETENCY:

1. Mix soils and soil conditioners by hand or mechanically.
2. Transport media by properly using equipment.

CRITERION MEASURE:

1. Soils and soil conditioners are uniformly mixed.
2. Mechanical equipment is operated in accordance to operator's manual.
3. Shovels, rakes, and hoes are used safely and effectively.
4. Soil mix is free of inconsistent materials.
5. Equipment is operated safely and correctly to transport media.

TASK # B23: Calibrate spreaders and compute total amount of lime and/or fertilizer required in seedbed preparation.

COMPETENCY: Apply recommended amounts of lime and fertilizer for specified areas based on soil test results using calibrated equipment.

CRITERION MEASURE:

1. Lime and fertilizer amounts for specified areas are determined according to soil test results.
2. Equipment is properly calibrated for application of determined rates.
3. Equipment is operated according to instructions found in the operator's manual.
4. All safety precautions are observed.

Appendix

SUBJECT AREA: Establishment of
Greens and Tees

- TASK # B24:** Select and determine amount of seed, sprigs, or sod required in establishment.
- COMPETENCY:** Select and determine correct amounts of pounds for seed; bushels for sprigs, and yards for sod for establishing specified greens and tees.
- CRITERION MEASURE:**
1. The proper varieties and quality of seeds, sprigs, or sod are selected.
 2. The correct amounts of seed, sprigs, and sod for specified greens and tees are correctly computed.
-
- TASK # B25:** Select and determine amount of mulch material required.
- COMPETENCY:** Select and determine correct amount of mulching material required for establishing greens and tees.
- CRITERION MEASURE:**
1. Mulching materials are correctly identified.
 2. Proper mulching materials are selected for specified greens and tees.
 3. Correct amounts of mulching materials are computed.
-
- TASK # B26:** Remove trees and debris.
- COMPETENCY:** Remove debris, trees, and other unwanted plants from specified areas safely without damaging other vegetation.
- CRITERION MEASURE:**
1. Trees, debris, and other vegetation are removed from specified areas safely and without damaging other vegetation.
 2. Tools and equipment are used safely and properly.
 3. Trucks and tractors that are used to haul the unwanted materials are operated safely and correctly.
 4. Specified areas are left neat and free of debris after removal of unwanted materials.

Appendix

SUBJECT AREA: Establishment of
Greens and Tees

TASK # B27: Plow, disk, and rake area.

COMPETENCY: Prepare a good seedbed by plowing, disking, tilling, raking, etc.

CRITERION
MEASURE:

1. Appropriate tools and equipment are selected.
2. The prepared seedbed is even and finely textured to a depth of 3-4 inches.
3. The equipment used in seedbed preparation is set up and adjusted correctly to provide maximum efficiency.
4. Tractor operation is efficient and handling procedures listed in the operator's manual are followed.
5. All safety precautions are observed.

TASK # B28: Lay out an irrigation system for tees and greens.

COMPETENCY: Design irrigation systems for tees and greens in accordance to accepted standards and practices.

CRITERION
MEASURE:

1. Types of irrigation systems are listed and discussed.
2. Irrigation design principles and practices are correctly illustrated.
3. Appropriate irrigation systems are designed for specified tees and greens.

TASK # B29: Install irrigation system.

COMPETENCY: Install an irrigation system for tees and greens according to established practices and procedures.

CRITERION
MEASURE:

1. Installation is in accordance with set standards and procedures.
2. Irrigation system fulfills the need on greens and tees.
3. Installation is accomplished in a safe and craftsmanship manner.
4. Irrigation system functions properly after installation is completed.

Appendix

SUBJECT AREA: Establishment of
Greens and Tees

- TASK # B30:** Plan and install drainage system.
- COMPETENCY:** Design and construct a drainage system for tees and greens following recommended procedures.
- CRITERION MEASURE:**
1. Drainage systems are designed in accordance with standard procedures and practices.
 2. Proper materials and equipment for installation are selected.
 3. Construction of drainage system is accomplished in a safe and efficient manner following recommended procedures.
 4. Tools and equipment are used safely and correctly.
 5. Drainage system functions properly after installation is completed.
-
- TASK # B31:** Estimate cost of materials, manhours, equipment use, etc. for establishing tees and greens.
- COMPETENCY:** Estimate cost of materials, manhours, equipment use, etc. for establishing tees and greens.
- CRITERION MEASURE:**
1. Types of materials and equipment needed to establish tees and greens are correctly determined.
 2. The number of manhours required to establish specified tees and greens is correctly estimated.
 3. The amount of materials needed to establish tees and greens are estimated.
 4. Materials, manhours, and equipment costs for establishing specified greens and tees are correctly estimated.
-
- TASK # B32:** Select planting dates.
- COMPETENCY:** Determine optimum planting dates for the various turf grasses used for greens and tees.
- CRITERION MEASURE:** Optimum planting dates are correctly given for the turf grasses that are used for greens and tees.

Appendix

SUBJECT AREA: Establishment of
Greens and Tees

TASK # B33: Level and sterilize seedbed.

COMPETENCY: Prepare seedbed for sterilization and sterilize seedbed using recommended chemicals and following recommended procedures.

CRITERION
MEASURE:

1. Seedbeds are properly prepared and leveled for sterilization.
2. Chemicals used for sterilization are correctly identified and specifications for use described.
3. Sterilization methods are correctly described.
4. Seedbeds are sterilized using correct chemicals following recommended procedures.
5. All safety precautions are observed.

TASK # B34: Apply fertilizer and lime.

COMPETENCY: Apply correct amounts of fertilizer and lime on newly established greens and tees following recommended procedures.

CRITERION
MEASURE:

1. Proper amounts of fertilizer and lime are determined from soil tests.
2. Application methods are consistent with accepted practices.
3. Correct types of fertilizer and lime are applied according to management, season conditions, recommendations, and other factors.
4. Equipment is correctly calibrated.
5. Equipment is operated safely and correctly.

TASK # B35: Mix seed.

COMPETENCY: Blend and mix seeding materials.

CRITERION
MEASURE:

1. Seed materials are mixed completely.
2. Safe and efficient methods for mixing are used.
3. Correct amounts of each seed source are mixed to cover areas.
4. Equipment used in mixing seeds is used safely and correctly.

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SUBJECT AREA: Establishment of
Greens and Tees

- TASK # B36:** Sow seed, sprig, stolonize, plug, or sod.
- COMPETENCY:** Sow seed, sprig, stolonize, plug, and sod plant specified grasses on tees and greens following recommended procedures.
- CRITERION MEASURE:**
1. Types of grasses that can be seeded, sprigged, stolonized, plugged, and sod planted are correctly identified.
 2. Procedures for seeding, sprigging, stolonizing, plugging, and sod planting are described and illustrated.
 3. Tees and greens are seeded, sprigged, stolonized, plugged, and sod planted using appropriate methods and following recommended procedures.
 4. Equipment is safely and correctly operated.
-
- TASK # B37:** Roll after planting.
- COMPETENCY:** Roll tees and greens lightly after planting.
- CRITERION MEASURE:**
1. Proper equipment is utilized and operated correctly.
 2. Area is rolled following recommended procedures.
-
- TASK # B38:** Apply mulching materials.
- COMPETENCY:** Apply mulching materials over an established turf grass area.
- CRITERION MEASURE:**
1. Mulching materials to use on greens and tees are correctly determined and identified.
 2. Different applications techniques are adequately illustrated.
 3. Newly established areas are adequately covered.
 4. Machinery used for mulching is operated safely and correctly.

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SUBJECT AREA: Establishment of
Greens and Tees

TASK # B39: Irrigate new plantings.

COMPETENCY: Irrigate newly established turf grass stands.

CRITERION
MEASURE:

1. Turf grass is watered only when needed.
2. No damage or injury is apparent to turf grass stand.
3. Correct type of irrigation equipment is utilized for specific situations.
4. Water amount is equal to field capacity level.
5. Water is evenly distributed to the area.

TASK # B40: Fertilize new plantings.

COMPETENCY: Apply correct amounts and types of fertilizer to newly planted greens and tees by mechanical application at the best times for optimum plant growth.

CRITERION
MEASURE:

1. Fertilizer schedules and rates are determined according to turf grass requirements.
2. Equipment is correctly calibrated.
3. Type of fertilizer and correct analysis is selected based on turf grass requirements and soil test results.
4. Fertilizer is correctly applied without damaging the turf.
5. All safety precautions are observed.

TASK # B41: Mow new plantings.

COMPETENCY: Mow newly established turf grass stands by mechanical equipment.

CRITERION
MEASURE:

1. All debris is removed from establishment area.
2. Area is inspected for disease and pest problems and erosion.
3. Mowers are sharp and adjusted properly.
4. Equipment is operated safely and properly.
5. Selection of mowing equipment best suits the individual situation.

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SUBJECT AREA: Establishment of
Greens and Tees

TASK # B42: Mix and apply pesticides to new plantings.

COMPETENCY: Mix and apply correct pesticides to new plantings.

**CRITERION
MEASURE:**

1. Chemical control measures are applied correctly following label instructions.
2. Sprayers, dusters, and foggers are correctly calibrated and operated according to manufacturer's recommendations.
3. Cultural and chemical control measures are used where appropriate and standard procedures are followed.
4. All safety precautions are observed.
5. Equipment is thoroughly cleaned after each use.

Appendix

SUBJECT AREA: Maintenance of Greens
and Tees

- TASK # C43:** Develop and prescribe mowing patterns, height of cut, type of mower and frequency of mowing.
- COMPETENCY:** Develop cultural program for greens and tees including mowing patterns, height of cut, type of mower, frequency of mowing, etc.
- CRITERION MEASURE:**
1. Prescribed mowing patterns are consistent with recommended and standardized techniques.
 2. Height that different types of grass should be cut is correctly determined.
 3. Selection of mowing equipment is correctly determined for different types of grass and other factors.
 4. Frequency of mowing is correctly determined by turf grass species and seasonal growth patterns.
-
- TASK # C44:** Mow greens, collars, aprons, and tees.
- COMPETENCY:** Mow greens, collars, aprons, and tees with mechanized equipment at prescribed patterns and heights of cuts.
- CRITERION MEASURE:**
1. Greens, collars, aprons, and tees are mowed at prescribed patterns and at proper height according to set professional standards.
 2. Turf grass surfaces are cut uniformly and without uneven areas or scared sections.
-
- TASK # C45:** Develop annual fertilization and liming programs.
- COMPETENCY:** Develop annual fertilization and liming programs for maintaining specified turf grasses used on tees and greens.
- CRITERION MEASURE:**
1. Recommended maintenance practices for fertilizing and liming different turf grasses are obtained from appropriate reference materials.
 2. Annual fertilization and liming programs are developed and recommended for maintaining specified turf grasses used on tees and greens.

Appendix

SUBJECT AREA: Maintenance of Greens
and Tees

TASK # C46: Calibrate spreaders and keep records of settings.

COMPETENCY: Correctly calibrate various types of spreaders used for fertilizing and liming tees and greens and keep records of settings.

CRITERION
MEASURE:

1. The various methods of calibrating spreaders are listed and illustrated.
2. Spreaders are correctly calibrated following recommended amounts of lime and fertilizer to apply for specified areas.
3. Spreader settings are recorded using appropriate forms and are properly filed for easy reference.

TASK # C47: Develop irrigation programs and set automatic controllers.

COMPETENCY: Develop recommended irrigation programs for tees and greens and set automatic controllers.

CRITERION
MEASURE:

1. Recommended times to irrigate and amounts of water to add per irrigation are obtained from appropriate reference material for various types of turf grasses used on tees and greens.
2. Determination of when to irrigate turf grasses based on grass types, weather conditions, soil conditions, and other factors is correctly provided.
3. General irrigation programs and practices are correctly developed and provided for maintaining various turf grasses.
4. Automatic controllers on various types of irrigation equipment are correctly set.

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SUBJECT AREA: Maintenance of Greens
and Tees

TASK # C48: Irrigate turf.

COMPETENCY: Irrigate specified turf grasses on tees and greens following recommended practices.

CRITERION
MEASURE:

1. Times to irrigate and amounts of water to use per irrigation are correctly determined for various turf grasses.
2. Various irrigation systems are correctly operated to properly irrigate tees and greens.

TASK # C49: Relocate and replace cups.

COMPETENCY: Relocate and replace cups on greens following recommended procedures.

CRITERION
MEASURE:

1. Greens are studied and cups are relocated that meet established guidelines for where cups should be placed.
2. Cup holes are correctly made using tools specifically designed for making holes.
3. Old cup holes are correctly filled and repaired.

TASK # C50: Relocate and replace tee markers.

COMPETENCY: Properly relocate and replace tee markers on tees.

CRITERION
MEASURE:

1. Tees are studied and tee markers are relocated that meet established guidelines for where tee markers should be placed.
2. Tee markers are removed and reset on the tee approximately perpendicular to the fairway or to where most golfers will be hitting the ball.
3. Tee markers are properly set into the soil so that they will remain permanent until they are moved again.

Appendix

SUBJECT AREA: Maintenance of Greens
and Tees

TASK # C51: Repair divots.

COMPETENCY: Repair divots on tees and fairways.

CRITERION
MEASURE:

1. Correct determination is made when divots should be repaired on tees and fairways.
2. Divots are correctly repaired following recommended procedures by sprigging, seeding, stolonizing, or sod planting with the same type turf grass that is on greens and tees.

TASK # C52: Develop renovation, verticutting, and/or topdressing programs.

COMPETENCY: Develop appropriate renovation, verticutting, and/or topdressing programs for tees and greens.

CRITERION
MEASURE:

1. Recommended renovation, verticutting, and/or topdressing practices and programs for tees and greens are obtained from appropriate reference materials.
2. Specified greens and tees are studied and appropriate renovation, verticutting, and/or topdressing programs are recommended.

TASK # C53: Apply fertilizer and lime according to soil test results.

COMPETENCY: Apply recommended amounts of lime and fertilizer on tees and greens based on soil test results using calibrated equipment.

CRITERION
MEASURE:

1. Lime and fertilizer amounts per acre are determined according to soil test results.
2. Equipment is properly calibrated for application of determined rates.
3. Equipment is operated according to instructions found in the operator's manual.
4. All safety precautions are observed.

Appendix

SUBJECT AREA: Maintenance of Greens
and Tees

- TASK # C54:** Aerify, slice, and spike turf.
- COMPETENCY:** Aerify, slice, and spike turf on tees and greens by properly operating equipment.
- CRITERION MEASURE:**
1. Turf on tees and greens are aerified, sliced, and spiked correctly following recommended procedures.
 2. Equipment is operated correctly and safely.
-
- TASK # C55:** Remove plugs.
- COMPETENCY:** Remove plugs from greens and tees correctly using tools and following recommended procedures.
- CRITERION MEASURE:**
1. Depth at which plugs are taken is correct.
 2. Plugs are taken on well established grass without damaging it.
 3. Tools for removing plugs are used correctly and efficiently.
-
- TASK # C56:** Verticut and remove verticut debris from turf.
- COMPETENCY:** Verticut greens and tees following recommended procedures and properly remove verticut debris from turf.
- CRITERION MEASURE:**
1. Equipment used to verticut greens and tees is operated safely and correctly.
 2. Correct procedures are followed for verticutting turf.
 3. Greens and tees are free of all debris after verticutting.

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SUBJECT AREA: Maintenance of Greens
and Tees

TASK # C57: Sterilize topdressing material.

COMPETENCY: Sterilize topdressing material using chemicals and steam following recommended procedures.

CRITERION MEASURE:

1. Procedures for sterilizing topdressing materials using chemicals and steam are correctly illustrated.
2. Samples of topdressing materials are correctly sterilized.

TASK # C58: Mix and apply topdressing material.

COMPETENCY:

1. Mix topdressing materials by hand and mechanical methods.
2. Apply topdressing materials on greens and tees using recommended methods.

CRITERION MEASURE:

1. Topdressing materials are uniformly mixed using hand tools and mechanical equipment.
2. Mechanical equipment used in mixing materials is operated safely and efficiently.
3. Topdressing materials are evenly distributed on greens and tees by properly using different types of spreaders.
4. Dates to apply topdressing materials on different turf grasses are correctly listed.

TASK # C59: Distribute topdressing with dragmat.

COMPETENCY: Distribute topdressing on greens and tees by properly using a dragmat.

CRITERION MEASURE: Dragmats are correctly used to distribute topdressing on greens and tees.

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SUBJECT AREA: Maintenance of Greens
and Tees

- TASK # C60:** Overseed and reseed turf.
- COMPETENCY:** Adequately prepare worn spots on turf and reseed using the same type grass as originally used.
- CRITERION MEASURE:**
1. Worn spots are evenly prepared to a depth of 3-4 inches.
 2. The same type of grass seed as originally used is selected.
 3. Seeds are sown evenly by hand and with mechanical equipment at recommended rates.
-
- TASK # C61:** Report pest problems.
- COMPETENCY:** Identify and report pest problems on tees and greens to supervisor.
- CRITERION MEASURE:** Pest problems on tees and greens are noticed, pests are identified, and problems are reported promptly to supervisor.
-
- TASK # C62:** Identify insects, diseases, and weeds which commonly infect turf areas.
- COMPETENCY:**
1. Correctly identify weeds, diseases, and insects that infect turf grasses visually and by using resource materials.
 2. Spell the common names of weeds, diseases, and insects
- CRITERION MEASURE:**
1. Selected weeds are identified by common names visually and by using resource materials.
 2. Selected diseases are identified by common names visually and by using resource materials.
 3. Selected insects are identified by common names visually and by using resource materials.
 4. Common names of weeds, diseases, and insects are spelled correctly.

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SUBJECT AREA: Maintenance of Greens
and Tees

- TASK # C63:** Use professional or governmental agencies to identify unusual pests and make recommendations.
- COMPETENCY:** Name and properly use professional and governmental agencies to identify unusual pests and obtain recommendations for their prevention and control.
- CRITERION MEASURE:**
1. Professional and governmental agencies that identify various pests and that make recommendations for their prevention and control are correctly determined.
 2. Professional and governmental agencies are properly used to identify unknown pests and to obtain information on prevention and control.
-
- TASK # C64:** Obtain, package, and mail samples of pests to be identified.
- COMPETENCY:** Collect samples of pests, properly package samples, and mail samples to appropriate agencies for identification.
- CRITERION MEASURE:**
1. Samples of turf grass pests are properly collected.
 2. Pest samples are correctly packaged following recommended procedures.
 3. Samples are mailed to proper agencies for identification.
-
- TASK # C65:** Obtain a commercial pesticide applicators license.
- COMPETENCY:** Take and pass the proper tests to obtain a commercial pesticide applicators license.
- CRITERION MEASURE:** A commercial pesticide applicators license is obtained by passing the proper tests required for the license.

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SUBJECT AREA: Maintenance of Greens
and Tees

- TASK # C66:** Select and mix insecticides, fungicides, and herbicides for prevention or control.
- COMPETENCY:**
1. Determine proper insecticides, fungicides, and herbicides needed for prevention and control of turf pests.
 2. Follow label directions and properly mix insecticides, fungicides, and herbicides for preventing and controlling turf pests.
- CRITERION MEASURE:**
1. Correct insecticides, fungicides, and herbicides are determined for preventing and controlling turf pests.
 2. Label directions are followed and insecticides, fungicides, and herbicides are properly and uniformly mixed.
-
- TASK # C67:** Calibrate sprayers and apply pesticides, herbicides, etc.
- COMPETENCY:** Read labels and apply pesticides, herbicides, and fungicides according to directions using calibrated equipment.
- CRITERION MEASURE:**
1. Pesticide, herbicide, and fungicide labels are correctly read and interpreted to determine the amounts to apply for specified areas.
 2. Equipment used to apply materials is calibrated correctly for application of determined rates.
 3. Materials are properly applied by correctly operating the equipment.
 4. All safety precautions are observed when handling chemicals and operating equipment.

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SUBJECT AREA: Maintenance of Greens
and Tees

TASK # C68: Take nematode assays.

COMPETENCY: Take nematode assays following recommended procedures and mail samples to proper testing laboratories.

CRITERION
MEASURE:

1. Soil samples (1 quart) are taken according to established and approved practices.
2. Information sheets are completed giving crop history in detail.
3. Samples are mixed in a plastic bucket and placed in a one-quart plastic bag.
4. Boxes, bags, information sheets are mailed to the proper state testing laboratories along with required costs.
5. The results are interpreted and if control is recommended, control procedures are followed.

Appendix

SUBJECT AREA: Establishment of
Fairways, Roughs,
and Sand Traps

- TASK # D69: Read and interpret blueprints and plans.
- COMPETENCY: Read and interpret blueprints and plans for fairways, roughs, and sand traps drawn by architects.
- CRITERION MEASURE:
1. The scale and legend on blueprints and plans are read and interpreted correctly.
 2. Symbols are read correctly.
 3. Design concepts and principles on blueprints and plans are read and interpreted correctly.
-
- TASK # D70: Design and prepare scaled drawings of proposed changes and/or additions to plans to include trees and shrubs.
- COMPETENCY: Prepare scaled drawings for changes and additions to original plans.
- CRITERION MEASURE: Revised plans are drawn to scale and follow correct principles of design.
-
- TASK # D71: Compute acreage.
- COMPETENCY: Compute acreage for fairways, roughs, and sand traps given specified dimensions.
- CRITERION MEASURE: Acreage is computed correctly for fairways, roughs, and sand traps.

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SUBJECT AREA: Establishment of
Fairways, Roughs,
and Sand Traps

- TASK # D72:** Take soil test and interpret results.
- COMPETENCY:** Take soil samples according to established procedures, fill out information sheet, submit samples to a soil testing laboratory, and interpret the returned results.
- CRITERION MEASURE:**
1. Soil samples are taken according to established and approved procedures.
 2. Information sheets are completed giving information on land use and fertilization and liming records.
 3. Soil samples and information sheets are mailed to state or private soil testing laboratories.
 4. Soil test results are interpreted and fertilization and liming amounts are determined.
-
- TASK # D73:** Determine total amount of amendments, fertilizers, and/or lime needs on an acreage basis.
- COMPETENCY:** From soil test results and cultural requirements of various grasses used on fairways and roughs, compute the amount of amendments, fertilizers, and lime needed per acre for specified periods of time.
- CRITERION MEASURE:**
1. Soil test results are interpreted correctly and recommended amounts of lime and fertilizer are computed correctly.
 2. Recommended cultural requirements for various grasses are listed.
 3. Amounts of fertilizer, lime, and amendments needed per acre are correctly determined for specified time periods.

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SUBJECT AREA: Establishment of
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and Sand Traps

TASK # D74: Determine amount of seed or sprigs for acreage.

COMPETENCY: Determine correct amount of pounds for seed and bushels for sprigs recommended for various turf grasses for establishing fairways and roughs.

CRITERION MEASURE:

1. Recommended amounts of seed and sprigs for various turf grasses for establishing fairways and roughs are obtained from reliable sources.
2. Total pounds of seed and bushels of sprigs from various turf grasses required for the total acreage of fairways and roughs are computed correctly.

TASK # D75: Compute amount of mulching material for acreage.

COMPETENCY: Select mulching materials and determine the amounts of various mulching materials required for specified acres for mulching fairways and roughs.

CRITERION MEASURE:

1. Proper mulching materials are identified and selected.
2. Total amounts of various mulching materials required for mulching specified acres of fairways and roughs are correctly computed.

TASK # D76: Designate equipment and steps to be used in land preparation.

COMPETENCY:

1. Determine the types and amounts of equipment needed to establish fairways, roughs, and sand traps.
2. Outline the steps required for developing fairways, roughs, and sand traps.

CRITERION MEASURE:

1. The types and amounts of equipment needed to establish fairways, roughs, and sand traps are correctly listed.
2. The steps required to establish fairways, roughs, and sand traps are correctly outlined and discussed.

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SUBJECT AREA: Establishment of
Fairways, Roughs,
and Sand Traps

TASK # D77: Remove trees and debris.

COMPETENCY: Remove debris, trees, and other unwanted plants from specified areas safely without damaging other vegetation.

CRITERION MEASURE:

1. Trees, debris, and other vegetation are removed from specified areas safely and without damaging other vegetation.
2. Tools and equipment are used safely and properly.
3. Trucks and tractors that are used to haul the unwanted materials are operated safely and correctly.
4. Specified areas are left neat and free of debris after removal of unwanted materials.

TASK # D78: Plow, disk, rake, or otherwise prepare land.

COMPETENCY: Prepare a good seedbed by plowing, disking, tilling, raking, etc.

CRITERION MEASURE:

1. Appropriate tools and equipment are selected.
2. The prepared seedbed is even and finely textured to a depth of 3-4 inches.
3. The equipment used in seedbed preparation is set up and adjusted correctly to provide maximum efficiency.
4. Tractor operation is efficient and handling procedures listed in the operator's manual are followed.
5. All safety precautions are observed.

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SUBJECT AREA: Establishment of
Fairways, Roughs,
and Sand Traps

TASK # D79: Apply fertilizer, lime, and/or other soil amendments.

COMPETENCY: Apply correct amounts of fertilizer, lime, and other soil amounts on fairways and roughs using calibrated equipment.

CRITERION MEASURE:

1. Lime, fertilizer, and other soil amendment amounts are correctly determined based on soil test results and cultural practices.
2. Equipment is properly calibrated for application of determined rates.
3. Equipment is operated according to instructions found in the operator's manual.
4. All safety precautions are observed.

TASK # D80: Lay out irrigation system for fairways.

COMPETENCY: Design irrigation system for fairways in accordance to accepted standards and practices.

CRITERION MEASURE:

1. Types of irrigation system are listed and discussed.
2. Irrigation design principles and practices are correctly illustrated.
3. Appropriate irrigation system are designed for specified fairways.

TASK # D81: Install irrigation system.

COMPETENCY: Install an irrigation system for fairways according to established practices and procedures.

CRITERION MEASURE:

1. Installation is in accordance with set standards and procedures.
2. Irrigation system fulfills the need on fairways.
3. Installation is accomplished in a safe and craftsmanship manner.
4. Irrigation system functions properly after installation is completed.

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SUBJECT AREA: Establishment of
Fairways, Roughs,
and Sand Traps

TASK # D82: Plan and install drainage system.

COMPETENCY: Design and construct a drainage system for fairways following recommended procedures.

CRITERION
MEASURE:

1. Drainage systems are designed in accordance with standard procedures and practices.
2. Proper materials and equipment for installation are selected.
3. Construction of drainage system is accomplished in a safe and efficient manner following recommended procedures.
4. Tools and equipment are used safely and correctly.
5. Drainage system functions properly after installation is completed.

TASK # D83: Level and smooth land preparatory to planting.

COMPETENCY: Use proper equipment and tools to level and prepare fairways, roughs, and sand traps.

CRITERION
MEASURE:

1. Proper equipment and tools are used correctly to level and smooth fairways, roughs, and sand traps.
2. Land is properly leveled and smoothed according to specifications.

TASK # D84: Stabilize steep banks.

COMPETENCY: Use appropriate materials to stabilize steep banks.

CRITERION
MEASURE:

1. Materials that may be used to stabilize steep banks are listed and discussed.
2. The appropriate materials to use in stabilizing steep banks are selected.
3. Steep banks are properly stabilized using appropriate materials and equipment.

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SUBJECT AREA: Establishment of
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TASK # D85: Compute sand requirements for traps on a tonnage or yardage basis.

COMPETENCY: 1. Select the type and quality of sand to be used in sand traps.
2. Determine the amount of sand required to fill sand traps at a specified depth based on tonnage and yardage.

CRITERION MEASURE: 1. Selected samples of sand are ranked on characteristics for sand trap usage.
2. The amount of sand required to fill sand traps is computed correctly.

TASK # D86: Select location for green and fairway traps.

COMPETENCY: Select the location of greens and fairway traps by using topographic maps and other visual aids.

CRITERION MEASURE: Greens and fairway traps are located by parameters prescribed by United States Golf Association, Carolinas Golf Association, and other golf associations

TASK # D87: Dig out sand traps, install drainage, and select and add sand.

COMPETENCY: Build sand traps as prescribed by architectural specifications.

CRITERION MEASURE: 1. Topographic maps are read correctly.
2. Sand trap construction equipment is operated safely and correctly - front-end loader, trencher, dump truck, and power sand trap rake.
3. Levels and rods are correctly used and read to establish slope.
4. Drainage systems are installed in sand traps according to specifications.
5. Appropriate sand is selected for sand traps and correct amounts are added to traps.

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SUBJECT AREA: Establishment of
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and Sand Traps

TASK # D88: Seed or sprig fairways and roughs at proper time.

COMPETENCY: Seed and sprig fairways and roughs at the proper time following recommended procedures.

- CRITERION MEASURE:
1. Types of grasses used for fairways and roughs are correctly determined and identified.
 2. Procedures for seeding and sprigging are described and illustrated.
 3. Fairways and roughs are seeded and sprigged at the proper time using appropriate methods following recommended procedures.
 4. Equipment is safely and correctly operated.

TASK # D89: Identify pests, diseases, and weeds.

- COMPETENCY:
1. Correctly identify weeds, diseases, and pests that infect turf grasses visually and by using resource materials.
 2. Spell the common names of weeds, diseases, and pests.

- CRITERION MEASURE:
1. Selected weeds are identified by common names visually and by using resource materials.
 2. Selected diseases are identified by common names visually and by using resource materials.
 3. Selected pests are identified by common names visually and by using resource materials.
 4. Common names of weeds, diseases, and pests are spelled correctly.

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SUBJECT AREA: Establishment of
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and Sand Traps

- TASK # D90:** Select and apply proper preventive or curative measures for pests, diseases, and weeds.
- COMPETENCY:** Select appropriate preventive and curative measures for pests, diseases, and weeds and follow recommended procedures in applying the appropriate measures.
- CRITERION MEASURE:**
1. Appropriate control measures for weeds, pests, and diseases are listed and discussed.
 2. Chemical control measures are applied correctly following label instructions.
 3. Sprayers, dusters, and foggers are operated according to manufacturer's recommendations and calibrated correctly.
 4. Biological, cultural, sanitation, and chemical control measures are used where appropriate, and recommended procedures.
 5. All safety precautions are observed.
 6. Equipment is thoroughly cleaned after each use, removing all residues.
-
- TASK # D91:** Plant and/or transplant trees and shrubs.
- COMPETENCY:**
1. Prepare holes and plant trees and shrubs following recommended procedures.
 2. Remove plants from original sites, place in prepared holes, and backfill holes with soil mix.
- CRITERION MEASURE:**
1. Trees and shrubs are removed from original sites by hand or mechanically without damaging roots, foliage, stems, or trunks.
 2. Holes are dug with the correct depth and diameter for selected plants.
 3. The equipment used to dig holes mechanically is operated according to manufacturer's recommendations and is used safely.
 4. Post-hole diggers, picks, shovels, and mattocks are used efficiently and safely.
 5. Plants are placed straight and at the correct depth.
 6. Plants are spaced so as not to crowd each other and are attractive.
 7. Holes are backfilled carefully in order not to damage roots, stems, bark, or foliage.
 8. Soil mix is packed firmly under and around the plant.
 9. A mound is constructed around the plant for adequate watering.

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SUBJECT AREA: Establishment of
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and Sand Traps

- TASK # D92: Irrigate newly planted turf, trees, and shrubs.
- COMPETENCY: Irrigate newly planted turf, trees, and shrubs following recommended procedures.
- CRITERION MEASURE:
1. Correct determination is made for when irrigation is needed.
 2. No water damage or injury is noted after irrigation.
 3. The correct amount of water is used when irrigating turf, trees, and shrubs.
 4. Water is evenly distributed to the area irrigated.
- TASK # D93: Fertilize newly planted turf, trees, and shrubs.
- COMPETENCY: Apply correct amounts and analysis of fertilizer to newly established turf, trees, and shrubs.
- CRITERION MEASURE:
1. Fertilizer amounts and analysis are determined according to variety and species growth characteristics, visual inspection, and soil tests.
 2. Equipment is properly calibrated for application to determined rates.
 3. Equipment is operated according to instructions found in the operator's manual.
 4. All safety precautions are observed.
- TASK # D94: Mow newly planted turf grasses.
- COMPETENCY: Mow newly established turf grasses using rotary, reel, and flail mowers following recommended practices.
- CRITERION MEASURE:
1. Mowing heights are determined by growth characteristics and species, varieties, and cultures.
 2. Mowing frequency is correctly determined by visual inspection of turf.
 3. Equipment is adjusted to pre-determined mowing heights.
 4. Equipment is operated according to manufacturer's specifications.
 5. All safety precautions are observed when operating mowers.

Appendix

SUBJECT AREA: Establishment of
Fairways, Roughs,
and Sand Traps

TASK # D95: Set boundaries on fairways.

COMPETENCY: Prescribe and mark boundaries on fairways.

CRITERION
MEASURE:

1. Fairway boundaries are located by parameters prescribed by the United States Golf Association, the Carolinas Golf Association, and other golf associations.
2. Fairway boundaries are correctly marked.

Appendix

SUBJECT AREA: Maintenance of
Fairways, Roughs,
and Traps

TASK # E96: Develop and prescribe mowing patterns, height of cut, type of mower, and frequency of mowing.

COMPETENCY: Prescribe mowing patterns, height of cut, and select types of mowers.

CRITERION MEASURE:

1. Mowing patterns are prescribed according to frequency of mowing and intensity of use.
2. Height of cut is correctly determined for various grass species.
3. Mowers are selected according to size acreage to be mowed, topography, grass species, intensity of culture, durability, and economic considerations.

TASK # E97: Mow fairways and roughs.

COMPETENCY: Mow fairways and roughs safely and efficiently using appropriate mowers.

CRITERION MEASURE:

1. Fairways and roughs are mowed correctly using appropriate pieces of equipment.
2. Manufacturer's recommendations are followed in use of fairway and rough mowers.
3. All safety precautions are observed.

TASK # E98: Develop annual fertilization and liming programs.

COMPETENCY: Establish annual fertilization and liming programs for specified grasses used for fairways and roughs.

CRITERION MEASURE:

1. Turfgrass annual fertilization requirements (minimum, optimum, and maximum) are established based on grass species and intensity of culture desired.
2. Seasonal and monthly fertilization requirements are correctly developed from annual amounts required.

Appendix

SUBJECT AREA: Maintenance of
Fairways, Roughs,
and Traps

TASK # E99: Calibrate spreaders and keep records of settings.

COMPETENCY: Correctly calibrate various types of spreaders used for fertilizing and liming fairways and roughs and keep records of settings.

CRITERION MEASURE:

1. The various methods of calibrating spreaders are listed and illustrated.
2. Spreaders are correctly calibrated following recommended amounts of lime and fertilizer to apply for specified areas.
3. Spreader settings are recorded using appropriate forms and are properly filed for easy reference.

TASK # E100: Apply fertilizer and lime according to soil test results.

COMPETENCY: Apply correct amounts of fertilizer and lime on fairways and roughs based on soil test results using calibrated equipment.

CRITERION MEASURE:

1. Lime and fertilizer amounts per acre are determined according to soil test results.
2. Equipment is properly calibrated for application of determined rates.
3. Equipment is operated according to instructions found in the operator's manual.
4. All safety precautions are observed.

Appendix

SUBJECT AREA: Maintenance of
Fairways, Roughs,
and Traps

TASK # E101: Develop irrigation programs and set automatic controllers.

COMPETENCY: Develop appropriate irrigation programs for fairways and select and set automatic controllers.

- CRITERION MEASURE:
1. Grass varieties are ranked on their water requirements and compared to evapotranspiration data for specified rations.
 2. Selected soil samples are analyzed to determine the infiltration and percolation rates.
 3. Water needs and irrigation time available is computed on a daily, weekly, and seasonal basis.
 4. Controllers are selected according to needs and availability.
 5. Controllers are correctly programmed based on previous considerations.

TASK # E102: Irrigate established fairways.

COMPETENCY: Irrigate established fairways according to recommended practices.

- CRITERION MEASURE:
1. Irrigation heads or quick couplers are located along with valves and controllers according to drawings and specifications.
 2. Controllers are programmed according to plant needs and infiltration and percolation rates or keys and mobile sprinklers are placed in quick couplers to provide water.
 3. The correct amounts of water are provided per irrigation.
 4. The water is evenly distributed over the areas irrigated.

Appendix

SUBJECT AREA: Maintenance of
Fairways, Roughs,
and Traps

TASK # E103: Develop program to re-establish fairways, roughs, and sand traps.

COMPETENCY: Develop programs to re-establish fairways, roughs, and sand traps.

CRITERION MEASURE:

1. Visual observations are made in the field to determine probable causes and degree of deterioration.
2. Scientific measures (soil and tissue tests) are employed to pin point problems.
3. Resource personnel and agencies are used in further estimating the causes and possible solutions.
4. A consolidated plan is developed with implementation procedures, priorities, completion dates, costs involved, and anticipated results.

TASK # E104: Re-establish turf by seeding, sprigging, or sodding.

COMPETENCY: Reseed, resod, and resprig turf by adequately preparing the soil and using the same type grass as originally used.

CRITERION MEASURE:

1. Soil is evenly prepared to a depth of 3-4 inches.
2. The same type of grass as originally used is selected.
3. Seeds are sown evenly and at recommended rates.
4. Sod is laid evenly with sides and ends fitting closely together.
5. Sprigs are planted at the proper depth and spacing.
6. Turf is adequately watered.

TASK # E105: Repair irrigation and drainage systems.

COMPETENCY: Perform minor repairs on irrigation and drainage systems.

CRITERION MEASURE:

1. Owners' manuals are correctly read and interpreted to assist in locating problems.
2. Inoperative irrigation and drainage systems are correctly analyzed to determine problems.
3. Necessary repairs are made to inoperative irrigation and drainage systems to correct the problems.

Appendix

SUBJECT AREA: Maintenance of
Fairways, Roughs,
and Traps

TASK # E106: Repair worn areas.

COMPETENCY: Repair worn areas in fairways using proper procedures.

CRITERION
MEASURE:

1. Worn spots are prepared to a depth of 3-4 inches.
2. Spots are reseeded, resprigged, or resodded using correct procedures.
3. Remainder of fairway is not damaged when repairing worn spots.
4. Repaired area is adequately watered.

TASK # E107: Mix and apply proper pesticides and herbicides to control or prevent insects, diseases, and weeds.

COMPETENCY: Mix and apply proper pesticides and herbicides to control and prevent insects, diseases, and weeds.

CRITERION
MEASURE:

1. Appropriate pesticides and herbicides are selected for particular pests and weeds.
2. If more than one pesticide is used, compatibility of the products is correctly determined.
3. Sprayers are correctly calibrated.
4. Pesticides are mixed and applied according to the labels.
5. All safety precautions are observed.

TASK # E108: Rake sand traps.

COMPETENCY: Rake sand traps using hand and mechanical rakes.

CRITERION
MEASURE:

1. Sand traps are raked mechanically and by hand according to methods prescribed by the USGA - Greens section.
2. Riding trap rakes are operated according to manufacturer's recommendations.

Appendix

SUBJECT AREA: Maintenance of
Fairways, Roughs,
and Traps

TASK # E109: Add sand to traps.

COMPETENCY: Add correct type and amount of sand to traps to meet specifications.

CRITERION
MEASURE:

1. Appropriate type of sand is selected to use in sand traps.
2. The correct amount of sand is added to traps to meet specifications.

TASK # E110: Trim and edge sand traps.

COMPETENCY: Trim and edge sand traps according to recommended procedures.

CRITERION
MEASURE:

1. Traps are correctly marked according to amounts of edging and finish specified.
2. Edging equipment or pesticides are used correctly to remove unwanted growth.
3. Material removed is transported to another site, general clean-up is completed, and sand traps are raked and are free of clippings and other debris.

TASK # E111: Take nematode assay.

COMPETENCY: Take a nematode assay and forward to proper testing laboratory for analysis.

CRITERION
MEASURE:

1. Soil samples (1 quart) are taken according to established and approved practices.
2. Information sheets are completed giving crop history in detail.
3. Samples are mixed in a plastic bucket and placed in a one-quart plastic bag.
4. Boxes, bags, and information sheets are mailed to the proper state testing laboratories along with required costs.
5. The results are interpreted correctly and if control is recommended, control procedures are followed.

Appendix

SUBJECT AREA: Maintenance of
Fairways, Roughs,
and Traps

TASK # E112: Overseed fairways.

COMPETENCY: Select grasses and overseed fairways following recommended procedures.

CRITERION
MEASURE:

1. Recommended overseeding grasses are selected.
2. Approved late summer and fall management practices are employed to prepare for overseeding.
3. Overseeding at specified rates, patterns, and time is accomplished.
4. Management and cultural practices are employed to insure germination and survival.
5. Equipment used for overseeding is operated safely and correctly.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

TASK # F113: Identify and use drafting equipment.

COMPETENCY: Correctly identify drafting equipment and use drafting equipment to make simple drawings neatly and accurately.

CRITERION MEASURE:

1. Drafting equipment is correctly identified.
2. Drafting equipment is used correctly to make drawings neatly and accurately.

TASK # F114: Develop knowledge of landscape symbols.

COMPETENCY: Correctly identify landscape design symbols.

CRITERION MEASURE: Landscape design symbols are correctly identified.

TASK # F115: Key and letter a drawing

COMPETENCY: Correctly key and letter drawings.

CRITERION MEASURE:

1. Drawings are correctly and clearly keyed.
2. Drawings are correctly and neatly lettered.

TASK # F116: Survey the landscape area.

COMPETENCY: Survey the area to be landscaped to determine dimensions, locate landscape features and determine where plants are needed.

CRITERION MEASURE:

1. The dimensions of the landscape area are correctly determined.
2. The landscape features are correctly located.
3. Locations where plants are needed are determined.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

TASK # F117: Develop landscape design for clubhouse, entrance, and other prescribed areas.

COMPETENCY: Prepare a landscape design that fits the situation.

CRITERION MEASURE:

1. The prepared design is neat, accurate, and practical for the situation.
2. Plants are selected that are available in the region and are suited for the selected site.
3. The design exhibits unity and balance.

TASK # F118: Prepare annual maintenance program for trees, shrubs, and other ornamentals.

COMPETENCY: Prepare annual maintenance programs for trees, shrubs, and other ornamentals.

CRITERION MEASURE:

1. A survey of ornamentals present and their identification is determined.
2. Cultural requirements and potential pests for each group of ornamental is determined.
3. Historical records in regard to previous practices and problems are determined.
4. A calendar of events for approved practices is developed.
5. Costs are computed based upon equipment, supply, and manpower needs.

TASK # F119: Prepare annual maintenance program for lakes and ponds.

COMPETENCY: Prepare an annual maintenance program for lakes and ponds that are on golf courses.

CRITERION MEASURE:

1. Selected aerial photographs are used to determine acreage and square footage of ponds and lakes.
2. Approximate and average depth of each area is determined to compute acre feet.
3. Potential and/or present pest problems are determined based on visual observations and appropriate references.
4. Controls are selected and applied based on label directions and existing local conditions.
5. A calendar of events for approved practices is developed.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

- TASK # F120:** Take soil test and interpret results.
- COMPETENCY:** Take soil samples according to established procedures, fill out information sheet, submit samples to a soil testing laboratory, and interpret the returned results.
- CRITERION MEASURE:**
1. Soil samples are taken according to established and approved procedures.
 2. Information sheets are completed giving information on land use and fertilization and liming records.
 3. Soil samples and information sheets are mailed to state or private soil testing laboratories.
 4. Soil test results are interpreted and fertilization and liming amounts are determined.
-
- TASK # F121:** Dig holes for planting trees and shrubs.
- COMPETENCY:** Dig holes by hand and by using mechanical equipment for planting trees and shrubs.
- CRITERION MEASURE:**
1. Hand tools and mechanical equipment used for digging holes are handled safely and used correctly.
 2. Depth and width of holes for different sizes and types of trees and shrubs are correct.
-
- TASK # F122:** Apply fertilizer and lime according to soil test results.
- COMPETENCY:** Apply recommended amounts of lime and fertilizer per acre based on soil test results using calibrated equipment.
- CRITERION MEASURE:**
1. Lime and fertilizer amounts per acre are determined according to soil test results.
 2. Equipment is properly calibrated for application of determined rates.
 3. Equipment is operated according to instructions found in the operator's manual.
 4. All safety precautions are observed.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

TASK # F123: Prepare seedbeds for flowers, other annuals, bulbs, etc.

COMPETENCY: Till and rake beds for planting flowers, bulbs, and other annuals.

**CRITERION
MEASURE:**

1. Tools and equipment used to prepare beds are handled safely and used correctly.
2. Beds are level, finely textured to a depth of 3-4 inches, and raked to move rocks and other debris.
3. Tile is correctly installed for proper drainage if needed.

TASK # F124: Plant trees and shrubs around clubhouse, entrance, and other prescribed areas.

COMPETENCY: Plant and transplant trees and shrubs in prescribed areas following recommended procedures.

**CRITERION
MEASURE:**

1. Trees and shrubs are removed from original sites by hand or mechanically without damaging roots, foliage, stems, or trunks.
2. Holes are dug with the correct depth and diameter for selected plants.
3. The equipment used to dig holes mechanically is operated according to manufacturer's recommendations and is used safely.
4. Post-hole diggers, picks, shovels, and mattocks are used efficiently and safely.
5. Plants are placed straight and at the correct depth.
6. Plants are spaced so as not to crowd each other and are attractive.
7. Holes are backfilled carefully in order not to damage roots, stems, bark, or foliage.
8. Soil mix is packed firmly under and around the plant.
9. A mound is constructed around the plant for adequate watering.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

TASK # F125: Plant annuals, bulbs, etc. in prescribed areas.

COMPETENCY: Plant annuals, bulb, etc. in prescribed areas using recommended procedures.

**CRITERION
MEASURE:**

1. Flower and bulb beds are even, finely textured to a depth of 3-4 inches, and raked to remove rocks and other debris.
2. Annuals and bulbs are planted at correct time, depth, exposure, and spacing.
3. Proper weed control measures are provided.
4. Adequate water supplies are provided.

TASK # F126: Prune and trim trees and shrubs at correct time using proper equipment and methods.

COMPETENCY: Prune plants at proper time using appropriate methods and tools.

**CRITERION
MEASURE:**

1. Correct times are identified for pruning various species of plants.
2. The proper pruning method is selected for the condition and type of plant.
3. Correct pruning procedures are followed for the selective and heading back pruning methods.
4. Reasons for pruning are correctly identified.
5. Appropriate tools are selected for the type of pruning to be done.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

TASK # F127: Remove and/or relocate trees and shrubs.

COMPETENCY: Dig established plants by hand or mechanically and replant them in a designated area.

**CRITERION
MEASURE:**

1. Established plants are dug without damaging the roots, bark, stems, branches, or foliage.
2. Recommended procedures are followed when digging plants.
3. Equipment used in digging plants is operated according to manufacturer's recommendations, and all recommended procedures are followed.
4. Shovels, mattocks, and other hand equipment is properly used.
5. Plantbeds and holes are prepared according to recommended practices.
6. Plants are placed in holes and beds according to recommended practices.

TASK # F128: Mow and edge lake banks and water hazards.

COMPETENCY: Mow and edge lake banks and water hazards on golf courses.

**CRITERION
MEASURE:**

1. Decisions on when grass should be mowed and edged around lake banks and water hazards are made correctly.
2. Correct types of equipment are selected to mow and edge grass around lake banks and water hazards.
3. Equipment used to mow and edge around lake banks and water hazards is operated correctly and safely.

TASK # F129: Select propagating stock.

COMPETENCY: Select propagating stock for successful propagation of plants.

**CRITERION
MEASURE:**

1. Appropriate stock is selected that will propagate successfully.
2. Propagation stock is selected at the appropriate time of the year.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

- TASK # F130:** Have knowledge of propagating structures and equipment.
- COMPETENCY:** List the characteristics of the various types of propagating structures and operate the structures and equipment.
- CRITERION MEASURE:**
1. The types of propagating structures are listed and characteristics of each type are correctly given.
 2. The type(s) of propagating structure is selected to best suit the needs or purposes of the situation.
 3. Propagating structures and the supporting equipment are operated correctly to insure successful propagation of plants.
-
- TASK # F131:** Have knowledge of propagating systems.
- COMPETENCY:** Identify, install, and operate propagating systems.
- CRITERION MEASURE:**
1. Types of propagating systems are correctly identified.
 2. Propagating systems are installed according to manufacturer's recommendations.
 3. The type(s) of system is selected that best fits the needs of the situation.
 4. Propagating systems are operated properly for successful propagating of plants.
-
- TASK # F132:** Maintain and repair propagating structures and equipment.
- COMPETENCY:** Maintain and repair propagating structures and equipment, using manufacturer's recommendations.
- CRITERION MEASURE:**
1. Mechanical and structural problems are identified.
 2. Appropriate materials, tools, and equipment are selected for repairs.
 3. Mechanical and structural problems are properly repaired according to manufacturer's recommendations.
 4. General maintenance program is set up and followed.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

TASK # F133: Propagate different types of plants at the correct time using proper techniques and procedures.

COMPETENCY: Propagate different types of plants at the correct time using recommended techniques and procedures.

CRITERION MEASURE:

1. The appropriate method for propagation of selected plants is determined.
2. Plant material and media are properly prepared for the propagation of selected plants.
3. Selected plants are propagated at the correct time using recommended techniques and procedures.

TASK # F134: Repair cart paths.

COMPETENCY: Repair cart paths using appropriate materials, equipment and following recommended procedures.

CRITERION MEASURE:

1. Selected golf cart surfacing materials are ranked on characteristics desirable.
2. Cart paths are of adequate width and depth and follows natural, convenient routes that avoid sharp turns.
3. Paths are designed so that all traffic does not enter and leave the path at the same place.
4. Cart paths are correctly repaired following recommended procedures and using correct materials, tools, and equipment.
5. Tools and equipment are used safely and correctly.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

TASK # F135: Identify pests, diseases, and weeds.

COMPETENCY: Correctly identify weeds, diseases, insects, and damage by other pests visually and by using resource materials; and spell the common names of weeds, diseases, and insects.

**CRITERION
MEASURE:**

1. Selected weeds are identified by common names visually and by using resource materials.
2. Selected diseases are identified by common names visually and by using resource materials.
3. Selected insects are identified by common names visually and by using resource materials.
4. Damage caused by other pests (i.e. rabbits) are identified.
5. Common names of weeds, diseases, and insects are spelled correctly.

TASK # F136: Determine methods of control needed to eradicate weeds, pests, and diseases.

COMPETENCY: List control methods for weeds, pests, and diseases from memory or by using reference material.

**CRITERION
MEASURE:** Control methods for weeds, pests, and diseases are correctly provided by recall or by using reference material.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

TASK # F137: Apply appropriate control measures.

COMPETENCY: Apply control measures on weeds, pests, and diseases using chemicals and other measures where appropriate. Calibrate equipment.

**CRITERION
MEASURE:**

1. Chemical control measures are applied correctly following label instructions.
2. Sprayers, dusters, and foggers are operated according to manufacturer's recommendations and calibrated correctly.
3. Biological, cultural, sanitation, and chemical control measures are used where appropriate, and recommended procedures.
4. All safety precautions are observed.
5. Equipment is thoroughly cleaned after each use, removing all residues.

TASK # F138: Rope off and direct traffic.

COMPETENCY: Rope off and direct traffic for participants and spectators on golf courses.

**CRITERION
MEASURE:**

1. The various forms of traffic are examined in regard to their degree of compaction, design of the course, and safety.
2. Golf courses are correctly redesigned for proper traffic dispersion using ornamental and structural materials.
3. Tee markers and cup placements are adequately rotated to avoid prolonged concentrated traffic.
4. Appropriate materials are selected and used to rope off traffic.

Appendix

SUBJECT AREA: Grounds Establishment
and Maintenance

- TASK # F139:** Stake and/or provide protection for injured trees, newly transplanted trees, etc.
- COMPETENCY:**
1. Support injured and newly transplanted trees and shrubs by guying and staking.
 2. Select and apply protective substance to plant wounds and infestations.
- CRITERION MEASURE:**
1. Correct type, number, and amount of materials are selected depending upon size and type of plants.
 2. Stakes are placed around the plant and driven into the ground with approximately 1/3 of the stakes showing above ground.
 3. Wire is placed around the plant with hose used for protection.
 4. Turn buckles are installed and an even amount of tension is applied to each wire.
 5. Plant wounds are correctly scraped and shaped for proper healing using recommended procedures and appropriate tools.
 6. Protective substances are selected that properly protect plants.
 7. Protective substances are uniformly applied to wounds and infested areas.
-
- TASK # F140:** Install edging material.
- COMPETENCY:** Prepare the area and install edging for various landscape areas.
- CRITERION MEASURE:**
1. Appropriate type of edging is selected for landscape areas.
 2. Appropriate materials are selected.
 3. Area and materials are prepared for installation.
 4. Edging is installed following recommended procedures.

Appendix

SUBJECT AREA: Construction of
Permanent and Semi-
Permanent Landscape
Features

- TASK # G141:** Construct and maintain fences using different types of materials.
- COMPETENCY:** Install and maintain fences using recommended types of materials and techniques.
- CRITERION MEASURE:**
1. Construction plans are correctly read and interpreted.
 2. Appropriate fence type and materials are selected.
 3. Area and materials are prepared for installation.
 4. Fence is constructed and finished to meet plan requirements.
 5. Fences are maintained using appropriate materials and techniques.
-
- TASK # G142:** Construct and maintain retaining walls using railroad ties, block, brick, rock, or other materials.
- COMPETENCY:** Construct and maintain retaining walls using railroad ties block, brick, rock, or other materials.
- CRITERION MEASURE:**
1. Construction plans are correctly read and interpreted.
 2. Appropriate materials are selected.
 3. Area and materials are properly prepared for wall installation.
 4. Walls are constructed and finished to meet plan requirements.
 5. Retaining walls are maintained by making correct repairs as needed.

Appendix

SUBJECT AREA: Construction of
Permanent and Semi-
Permanent Landscape
Features

TASK # G143: Construct walks and drives.

COMPETENCY: Install walks and driveways using brick, concrete, paving blocks, and other appropriate materials following blueprints and utilizing accepted construction techniques.

CRITERION MEASURE:

1. Construction plans are correctly read and interpreted.
2. Appropriate materials are selected.
3. Area and materials are properly prepared for installation.
4. Walks and driveways are correctly installed and finished to meet construction requirements.

TASK # G144: Construct patios and small terraces.

COMPETENCY: Construct patios and small terraces using brick, concrete, patio blocks, and other appropriate materials following blueprints and utilizing accepted construction techniques.

CRITERION MEASURE:

1. Construction plans are correctly read and interpreted.
2. Appropriate types and amounts of materials are selected.
3. Area and materials are properly prepared for installation.
4. Patios and small terraces are correctly installed and finished to meet construction requirements.

TASK # G145: Construct benches.

COMPETENCY: Construct garden bench seats by following prepared blueprints and utilizing proper construction techniques.

CRITERION MEASURE:

1. Construction plans are correctly read and interpreted.
2. Appropriate materials are selected.
3. Materials are measured and cut accurately.
4. Benches are correctly constructed and finished to meet plan requirements.

Appendix

SUBJECT AREA: Construction of
Permanent and Semi-
Permanent Landscape
Features

TASK # G146: Construct planters.

COMPETENCY: Construct planters by following prepared blueprints and utilizing proper construction techniques.

CRITERION
MEASURE:

1. Construction plans are correctly read and interpreted.
2. Appropriate materials are selected.
3. Materials are measured and cut accurately for construction.
4. Planters are correctly constructed and finished to meet plan requirements.

TASK # G147: Erect proper lighting for specified areas.

COMPETENCY: Install suitable lighting for recreation and garden areas.

CRITERION
MEASURE:

1. Appropriate type of lighting system is selected for area.
2. Appropriate type of lighting system is correctly designed for location.
3. Appropriate materials are selected.
4. Area and materials are properly prepared for installation.
5. Lighting system correctly installed to meet plan requirements and passes electrical inspection.

Appendix

SUBJECT AREA: Maintenance of
Buildings and
Equipment

TASK # H148: Keep work and storage areas neat and clean.

COMPETENCY:

1. Keep work and storage areas free of dirt, trash, and other foreign materials.
2. Keep work and storage areas organized and neat.

CRITERION MEASURE: Work and storage areas are kept free of dirt and trash with tools and materials well organized for easy access and pleasant working conditions.

TASK # H149: Clean hand tools and equipment.

COMPETENCY: Clean hand tools and equipment using proper cleansing agents and following recommended procedures.

CRITERION MEASURE:

1. Proper cleansing agents are selected for cleaning hand tools and equipment.
2. Hand tools and equipment are properly cleaned following recommended procedures.
3. All safety precautions are observed when cleaning hand tools and equipment.
4. After cleaning, hand tools and equipment are free of dirt, grease, trash, and other foreign materials.

TASK # H150: Sharpen hand tools.

COMPETENCY: Sharpen hand tools with a proper blade edge in a safe manner.

CRITERION MEASURE:

1. The correct blade edge for a tool is determined.
2. The correct sharpening equipment is selected and properly used.
3. Hand tools are correctly sharpened.
4. Proper safety precautions are observed.

Appendix

SUBJECT AREA: Maintenance of
Buildings and
Equipment

TASK # H151: Grind and sharpen mower blades.

COMPETENCY: Sharpen mower blades to a proper edge in a safe manner.

CRITERION MEASURE:

1. The correct edge for a blade is determined.
2. The correct sharpening equipment is selected and properly used.
3. Mower blades are correctly sharpened.
4. Proper safety precautions are observed.

TASK # H152: Backlap reels.

COMPETENCY: Backlap reels such that edges are properly honed and reel blades are properly matched to bedknife.

CRITERION MEASURE:

1. Bedknife is properly adjusted to reel.
2. Reel is backlapped using proper honing compound.
3. Reel unit cuts smoothly with minimum contact to bedknife.
4. Proper safety precautions are observed.

TASK # H153: Set mowing heights and adjust reels to bedknife.

COMPETENCY: Set reel to bedknife adjustment and mowing height adjustment such that a correct high quality turf grass surface is achieved with mowing.

CRITERION MEASURE:

1. Bedknife is adjusted to the reel to provide a smooth cut with minimum contact.
2. Mowing height is set to the specified height after reel to bedknife adjustment.
3. Proper safety precautions are observed.

Appendix

SUBJECT AREA: Maintenance of
Buildings and
Equipment

- TASK # H154:** Change reels and verticut units on triplex mowers.
- COMPETENCY:** Change reels and verticut units on triplex mowers properly with a minimum requirement of time.
- CRITERION MEASURE:**
1. Proper tools and techniques are used for removing drive mechanisms from accessories.
 2. Once in place accessories are properly adjusted for the upcoming job.
 3. Proper safety precautions are observed.
-
- TASK # H155:** Change and set nozzles on spray equipment.
- COMPETENCY:** Select proper nozzles and adjust them to provide correct application pattern.
- CRITERION MEASURE:**
1. Nozzle type is correctly selected based on type of application to be made.
 2. Nozzle strainers are cleaned and correctly sized.
 3. Nozzle is correctly attached and adjusted.
 4. Spray application is checked after nozzles are adjusted.
-
- TASK # H156:** Check and change oil in motors on power-driven turf equipment.
- COMPETENCY:** Maintain crankcase oil at the proper quantity and quality in power-driven turf equipment.
- CRITERION MEASURE:**
1. Oil levels are checked before each use of equipment and dip sticks are read correctly.
 2. Oil is selected for equipment that meets manufacturer's recommendations.
 3. Oil is correctly changed according to the hours and conditions of use.
 4. Oil filters are changed according to manufacturer's recommendations.

Appendix

SUBJECT AREA: Maintenance of
Buildings and
Equipment

TASK # H157: Check and change belts and chain drivers in power-driven turf equipment.

COMPETENCY: Maintain belts and chain drivers in good condition to prevent equipment breakdowns.

CRITERION MEASURE:

1. Belts and chain drivers are inspected and worn and damaged belts and chain drivers are detected.
2. Worn and damaged parts are promptly replaced.
3. Belts and chains are kept in proper adjustment.
4. Proper safety precautions are observed.

TASK # H158: Grease power-driven turf equipment.

COMPETENCY: Lubricate equipment according to manufacturer's recommendations.

CRITERION MEASURE:

1. Manufacturer's lubrication schedule is followed.
2. Equipment is correctly lubricated with correct lubricant.
3. Equipment is kept clean of waste lubricant.

TASK # H159: Check and change air filters in power-driven turf equipment.

COMPETENCY: Maintain engine efficiency by assuring adequate air intake.

CRITERION MEASURE:

1. Air filters are periodically checked and condition of filters is correctly noted.
2. Air filters not designed for cleaning are replaced correctly.
3. Filters that can be cleaned are properly serviced.

Appendix

SUBJECT AREA: Maintenance of
Buildings and
Equipment

- TASK # H160:** Check tires and tire pressure.
- COMPETENCY:** Check tires for wear, damage, and proper inflation.
- CRITERION MEASURE:**
1. Tire pressure is correctly checked on tractors and other farm equipment.
 2. Tires are checked and wear, damage, and other conditions of tires are correctly noted.
 3. Proper tire pressures are maintained on equipment based on manufacturer's recommendations.
-
- TASK # H161:** Check, refill, and charge batteries.
- COMPETENCY:** Maintain battery electrolyte levels and charge weak batteries.
- CRITERION MEASURE:**
1. Batteries are properly checked and electrolyte levels are correctly noted.
 2. Battery electrolyte is maintained at specified levels by proper addition of water.
 3. Battery charger is correctly used to charge weak batteries.
 4. Proper safety precautions are observed.
-
- TASK # H162:** Replace tines and blades on aerators, verticutters, slicers, and spikers.
- COMPETENCY:** Detect worn tines and blades on aerators, verticutters, slicers, and spikers and replace as needed.
- CRITERION MEASURE:**
1. Tines and blades are checked frequently during use and worn tines are correctly noted.
 2. Replacement tines and blades are correctly installed and properly adjusted according to recommended procedures.
 3. Proper safety precautions are observed.

Appendix

SUBJECT AREA: Maintenance of
Buildings and
Equipment

- TASK # H163:** Maintain and repair small gasoline engines.
- COMPETENCY:** Perform preventive maintenance and needed repairs on small gasoline engines.
- CRITERION MEASURE:**
1. Manufacturer's routine maintenance schedules are followed.
 2. Maintenance is geared to conditions of use.
 3. Maintenance procedures on small gasoline engines are properly carried out.
 4. Engine malfunctions are diagnosed and necessary repairs are performed following recommended procedures.
 5. Proper safety precautions are observed.
-
- TASK # H164:** Read and interpret owner's manual for ordering parts.
- COMPETENCY:** Order correct parts based on parts manuals.
- CRITERION MEASURE:**
1. The correct schematic drawing is located and read correctly for specified parts.
 2. The necessary information about the machine and needed parts is gathered.
 3. Necessary information is recorded on a requisition or order form.
-
- TASK # H165:** Tune-up
- COMPETENCY:** Replace spark plugs and points and properly set engine timing.
- CRITERION MEASURE:**
1. Correct spark plugs and points are selected.
 2. Old spark plugs and points are correctly removed from engine.
 3. Spark plugs and points are installed with correct gap.
 4. Ignition timing is correctly set following manufacturer's recommendation.
 5. Proper safety precautions are observed.

Appendix

SUBJECT AREA: Maintenance of
Buildings and
Equipment

TASK # H166: Prepare annual maintenance program for signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets.

COMPETENCY: Program and allocate personnel, equipment, supplies, and money to maintain signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets.

CRITERION MEASURE:

1. An inventory of signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets is performed.
2. Routine checks of the items are incorporated into the daily and weekly work schedule of prescribed individuals.
3. Standing operating procedures are prescribed for replenishing, repair, and replacement of signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets.

TASK # H167: Maintain, clean, and repair, when appropriate, signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets.

COMPETENCY: Maintain, clean, and repair, when appropriate, signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets.

CRITERION MEASURE:

1. Correct cleaning and restocking material is selected and used for ball washers and water fountains.
2. Trash baskets are emptied on a routine basis.
3. Correct paint and painting procedures are used on signs, ball washers, benches, trash baskets, and possibly bridges and tee markers.
4. Tee markers are correctly relocated to disperse traffic and wear.
5. Signs, ball washers, bridges, tee markers, benches, water fountains, and trash baskets are correctly repaired as needed.

Appendix

SUBJECT AREA: Records

TASK # I168: Keep employee time records.

COMPETENCY: Use necessary forms for maintaining work records of employees, record data, and keep accurate files.

CRITERION MEASURE:

1. Adequate employee work record forms are used to obtain necessary information.
2. Employee attendance records are kept daily and accurately recorded on forms.
3. Employee progress records are correctly completed from information provided and filed alphabetically by employee name.
4. Work records are filed alphabetically by employee name.

TASK # I169: Keep records of receipts and expenses.

COMPETENCY:

1. Record receipt and expense records on appropriate forms.
2. File and provide data periodically on receipt and expense records according to sales, purchases, public relations, and other needed categories.

CRITERION MEASURE:

1. Receipt and expense records are recorded correctly on appropriate forms.
2. Receipt and expense records are filed correctly according to pre-established categories.
3. Accurate summary data is provided on receipts and expenses for specified time periods.

TASK # I170: Keep records of fertilizers, lime, and pesticides applied.

COMPETENCY: Keep records of fertilizers, lime, and pesticides applied to specified landscape areas.

CRITERION MEASURE:

1. Appropriate record books are selected.
2. Areas are broken up and identified.
3. Square footage and/or acreage for each area is determined and recorded.
4. Rate, dates, and total amounts of fertilizers, lime, and pesticides applied are recorded.

Appendix

SUBJECT AREA: Records

- TASK # I171:** Keep records of gasoline usage.
- COMPETENCY:** Keep records of gasoline usage.
- CRITERION MEASURE:**
1. All gas operated pieces of equipment are identified and recorded.
 2. Appropriate records are established for each piece of equipment.
 3. Amount of gasoline for each piece of equipment along with mileage and/or operational hours is recorded.
 4. Monthly and yearly usage records are established and maintained.
-
- TASK # I172:** Keep daily and yearly rainfall and weather records.
- COMPETENCY:** Keep daily and yearly rainfall and weather records.
- CRITERION MEASURE:**
1. Established rainfall and weather records are obtained from the Soil Conservation Service, Agricultural Extension Service, US Weather Bureau, etc.
 2. These records are compared to important current forecasts and readings taken on the site.
 3. Significant historical changes are recorded.
-
- TASK # I173:** Prepare employee payroll.
- COMPETENCY:** Obtain necessary information to prepare employee payrolls.
- CRITERION MEASURE:**
1. All information needed to prepare employee payrolls is obtained from appropriate forms.
 2. Gross salary is accurately determined.
 3. All deductions are accurately determined.
 4. Net salary is accurately determined.
 5. Information is recorded on forms for filing and for reporting of withheld funds to state and federal agencies.

Appendix

SUBJECT AREA: Records

TASK # I174: Assist in records audit.

COMPETENCY: Assists auditor by providing records and needed information for auditing purposes.

CRITERION
MEASURE:

1. Records are made readily available for auditor.
2. Necessary additional computations are made and provided to auditor.
3. Necessary resources (personnel, form examples, books, etc.) are provided to the auditor.

TASK # I175: Assist in preparing income and tax and other necessary reports.

COMPETENCY: Prepare income tax forms and other necessary reports and mail to proper locations by required filing dates.

CRITERION
MEASURE:

1. Income tax forms are completed accurately (state and federal).
2. Estimated tax forms, employee withholding tax forms, workman compensation forms, social security forms, and other required state and/or federal forms are completed accurately.
3. Filing dates for required forms are listed correctly.
4. All forms are mailed to correct location.

TASK # I176: Keep annual depreciation schedule.

COMPETENCY: Prepare annual depreciation schedules on equipment, buildings, etc.

CRITERION
MEASURE:

1. Depreciation schedules are determined that will allow for the best tax credits or will fit the business needs best.
2. Depreciation schedules are accurately calculated.

Appendix

SUBJECT AREA: Records

- TASK # I177:** File records and other materials.
- COMPETENCY:** File records and all other materials accurately using an established or accepted filing system.
- CRITERION MEASURE:**
1. The records are filed with 100% accuracy.
 2. The filing system is simple with ease of retrieving information.
-
- TASK # I178:** Develop adequate record system for ordering and restocking plants, materials, supplies, repair parts, etc.
- COMPETENCY:** Develop or adapt a system of keeping records for ordering and restocking plants, materials, pricing, determining quantities for production and for profit analysis.
- CRITERION MEASURE:**
1. Plants are ordered and restocked when inventories decrease to a specified level.
 2. Materials are ordered and restocked when inventories decrease to a specified level.
 3. Prices of plants are periodically examined and changed as costs increase.
 4. Production quantities are periodically examined and adjusted according to supply and demand.
 5. Income and expenses on each enterprise engaged in are periodically examined and analyses made to determine profit or loss.
-
- TASK # I179:** Keep maintenance and repair records on equipment.
- COMPETENCY:** Keep maintenance and repair records on equipment.
- CRITERION MEASURE:**
1. Maintenance and repair records on equipment are kept accurately.
 2. Maintenance and repair records on equipment are filed accurately for each reference.

Appendix

SUBJECT AREA: Inventory

- TASK # J180:** Keep current inventory of supplies, repair parts, oil and grease, seed, fertilizers, lime, pesticides, etc.
- COMPETENCY:**
1. The inventory of supplies, repair parts, oil, grease, seed, fertilizers, lime, pesticides, etc. using appropriate procedures.
 2. Keep inventory records current.
- CRITERION MEASURE:**
1. Inventory of supplies, repair parts, oil, grease, seed, fertilizers, lime, pesticides, etc. is taken on appropriate schedules following correct procedures.
 2. Inventory data is recorded neatly and accurately.
 3. Inventory data is filed accurately and data is retrieved easily.
-
- TASK # J181:** Check received merchandise against invoice listings.
- COMPETENCY:** Check received merchandise against invoice listings.
- CRITERION MEASURE:** Invoices are read and shipment quantities and descriptions are checked against invoice listings.
-
- TASK # J182:** Take annual inventory for tax purposes.
- COMPETENCY:** Understand, apply, and complete inventory forms.
- CRITERION MEASURE:**
1. Specific inventory forms necessary for given time period are determined.
 2. Inventory forms are completed accurately and legibly.
 3. Reasons for taking inventory are listed correctly.

Appendix

SUBJECT AREA: Inventory

TASK # J183: Check invoices for math errors.

COMPETENCY: Check invoices for errors.

CRITERION MEASURE:

1. Invoices are read and items cross-referenced for accuracy.
2. Numbers received and numbers listed are calculated and corrections made.
3. Shippers and manufacturers are contacted about discrepancies.

TASK # J184: Store received merchandise.

COMPETENCY: Store received merchandise.

CRITERION MEASURE: Received merchandise is stored in an orderly and functional manner without damage.

TASK # J185: Order replacement and/or new merchandise.

COMPETENCY: Order replacement and/or new merchandise.

CRITERION MEASURE:

1. Merchandise needs are analyzed.
2. Catalogs and sales lists are used for obtaining correct prices and order numbers.
3. Order forms are filled out and submitted or telephone requests are made to manufacturer or distributor.

TASK # J186: Arrange for transportation of materials purchased.

COMPETENCY: Arrange for transportation of materials purchased.

CRITERION MEASURE:

1. Appropriate mode of transportation is selected for various types of materials.
2. Transportation arrangements are made with shipper.

Appendix

SUBJECT AREA: Inventory

- TASK # J187: Order repair parts for business vehicles and equipment.
- COMPETENCY: Order repair parts for business vehicles and equipment.
- CRITERION
MEASURE:
1. Repair parts' needs are analyzed.
 2. Catalogs and sales lists are used for obtaining correct prices and order numbers.
 3. Order forms are filled out and submitted or telephone requests are made to manufacturer or distributor.

Appendix

SUBJECT AREA: Management

- TASK # K188:** Understand and comply with business laws.
- COMPETENCY:** Understand and comply with business laws, tax laws, and laws pertaining to hiring, paying, and treating of employees.
- CRITERION MEASURE:**
1. Applicable business laws, tax laws, and laws pertaining to employee hiring and firing are obtained, read, and correctly interpreted.
 2. Information that is not understood is directed to the proper agencies for answers.
 3. Business, tax, and employee rules and regulations are correctly illustrated in case examples of business operations.
-
- TASK # K189:** Understand and comply with OSHA and EPA regulations.
- COMPETENCY:** Understand and comply with OSHA, EPA, and NCDA guidelines and regulations.
- CRITERION MEASURE:**
1. Applicable OSHA, EPA, and NCDA guidelines and regulations are obtained, read, and correctly interpreted.
 2. Questions are addressed to appropriate agencies for assistance on rules and regulations not understood.
 3. OSHA, EPA, and NCDA guidelines and regulations are correctly illustrated in case examples of business operations.
-
- TASK # K190:** Identify labor needs.
- COMPETENCY:** Identify labor needs for various sizes and types of golf courses.
- CRITERION MEASURE:** Labor needs are determined accurately for various sizes and types of golf courses.

Appendix

SUBJECT AREA: Management

- TASK # K191:** Recruit, interview, and select employees.
- COMPETENCY:** Recruit, interview, and select employees based on needed qualifications.
- CRITERION MEASURE:**
1. Employee positions are advertised by legal and ethical methods.
 2. Prospective employees are interviewed using accepted interviewing techniques.
 3. Employees are selected for positions based on needed qualifications.
-
- TASK # K192:** Designate and prepare work schedules for employees.
- COMPETENCY:** Designate employee work assignments.
- CRITERION MEASURE:** Selected job requirements are defined and employee skills and expertise are matched to work requirements.
-
- TASK # K193:** Train new employees.
- COMPETENCY:** Set up a training program for new employees and an ongoing inservice program.
- CRITERION MEASURE:**
1. A thorough and effective training program is developed for training new employees for selective jobs.
 2. An ongoing inservice program is developed for keeping all employees current and motivated.

Appendix

SUBJECT AREA: Management

TASK # K194: Supervise employees.

COMPETENCY:

1. Illustrate supervision principles and concepts.
2. Supervise a group of individuals or specified jobs for specified periods of time.

CRITERION MEASURE:

1. Supervision principles and concepts are correctly described and illustrated.
2. Individuals working on specified projects are properly supervised.

TASK # K195: Evaluate employee performance.

COMPETENCY: Develop evaluation procedure and objectively evaluate employee performance.

CRITERION MEASURE:

1. An evaluation procedure is developed that is practical, objective, and fair, and meets the needs of the business operation.
2. Employee performance is objectively evaluated based on the established criteria for the job and utilizing the developed evaluation procedure.

TASK # K196: Recommend personnel actions such as promoting, firing, disciplinary action.

COMPETENCY: Establish personnel regulations and perform personnel actions such as promoting, firing, disciplinary action, etc.

CRITERION MEASURE:

1. Personnel regulations are established that are practical and meet the needs of the business operation.
2. Personnel actions are performed as indicated in the personnel regulations or as situations demand.

Appendix

SUBJECT AREA: Management

TASK # K197: Identify equipment and supply needs.

COMPETENCY: Identify equipment and supply needs and determine types and quantities to buy and stock.

CRITERION MEASURE:

1. Equipment and supply needs are identified for selected business operations.
2. Types and quantities of equipment and supplies to buy and stock are determined based on present and future needs.

TASK # K198: Identify and select producers and suppliers of plants, equipment, supplies, etc.

COMPETENCY: Identify and select producers and suppliers of plants, equipment, supplies, etc.

CRITERION MEASURE:

1. Producers and suppliers are identified by appropriate methods.
2. Producers and suppliers are selected based on reputable sources of information.

TASK # K199: Order or purchase equipment, supplies, etc.

COMPETENCY: Order replacement and/or new merchandise.

CRITERION MEASURE:

1. Merchandise needs are analyzed.
2. Catalogs and sales lists are used for obtaining correct prices and order numbers.
3. Order forms are filled out and submitted or telephone requests are made to manufacturer or distributor.

Appendix

SUBJECT AREA: Management

TASK # K200: Enforce safety regulations.

COMPETENCY: Enforce safety regulations through seminars or workshops with supervisors and/or employees.

CRITERION MEASURE:

1. Supervisors and/or employees are periodically checked to determine if they are following safety precautions with irregularities found reported in written form.
2. Supervisors and/or employees are supervised daily to encourage safety consciousness.

TASK # K201: Establish employee wages, hours, and working conditions.

COMPETENCY: Establish employee wages, hours, and working conditions.

CRITERION MEASURE:

1. Employee wages, hours, and working conditions are established for specific job situations that are practical.
2. An appropriate (daily, weekly, monthly) work schedule is developed for employee work assignments.

TASK # K202: Administer social security and other employee benefit programs.

COMPETENCY: Administer social security and other employee benefit programs.

CRITERION MEASURE:

1. Appropriate agencies and companies are contacted about employee benefit programs.
2. Benefit programs are thoroughly explained to employees.
3. Appropriate forms are correctly completed and submitted to agencies and companies.

Appendix

SUBJECT AREA: Management

TASK # K203: Determine need for, select reputable insurery, and purchase comprehensive business insurance.

COMPETENCY: Determine the need for business insurance, select a reputable insurance company, and purchase comprehensive business insurance.

CRITERION MEASURE:

1. Appropriate insurance needs are identified for selected business operations.
2. Reputable insurance company is selected and appropriate types and amounts of insurance is purchased to cover identified risks.

TASK # K204: Determine business credit needs.

COMPETENCY: Analyze the business assets, liabilities, expansion plans, profits and current credit and determine additional credit needs.

CRITERION MEASURE:

1. Business assets are correctly identified.
2. Business liabilities are correctly identified.
3. Profits are correctly calculated.
4. Current credit use is correctly determined.
5. Projections for additional credit needs are determined based on identified financial situations and expansion plans.

TASK # K205: Locate sources of and secure credit.

COMPETENCY: Identify credit sources, analyze alternative choices, and secure the type of credit best suited for the business.

CRITERION MEASURE:

1. Credit sources are correctly identified.
2. Types of credit and alternative payment plans are correctly determined and analyzed.
3. Credit is chosen that best fits the business situation.
4. Application forms are correctly completed and final transactions made.

Appendix

SUBJECT AREA: Management

TASK # K206: Prepare annual budgets.

COMPETENCY: Prepare and present annual budget requests on specified business operations.

CRITERION MEASURE:

1. Previous expenditures in regard to capital and operating monies are examined on a yearly and monthly basis.
2. Previous work schedules and priorities are examined.
3. Condition and amount of equipment and supplies is noted.
4. An annual maintenance program is prepared on a monthly and seasonal basis including equipment, supplies, and labor needs.
5. Shortage and projected purchases are noted on a monthly basis.
6. Cash flow expenditures are developed on a monthly basis.
7. The annual budget request is presented orally and in writing.

TASK # K207: Keep golfers informed of problems, changes, and/or additions to course.

COMPETENCY: Keep golfers informed of problems, changes, and/or additions to course.

CRITERION MEASURE:

1. The organization structure of the course is determined.
2. Current means of two-way communication are examined to determine the most appropriate way to relay timely information.
3. Golfers are properly informed of changed course conditions, and other situations needing their attention.

TASK # K208: Have a good knowledge of playing golf.

COMPETENCY:

1. Describe the various rules of golf.
2. Relate the rules to maintenance and upkeep of the course.

CRITERION MEASURE:

1. The rules of golf, terminology, and etiquette on the course are described.
2. Golf equipment is correctly identified and illustrated.
3. The demands of the game are applied to maintenance operations.

Appendix

SUBJECT AREA: Management

- TASK # K209:** Determine when facility should be opened and closed due to inclement weather.
- COMPETENCY:** Determine when the facility should be opened and closed due to inclement weather.
- CRITERION MEASURE:**
1. Minimum environmental conditions for opening the course are identified.
 2. Environmental testing equipment is used to determine when minimum conditions are met.
 3. Appropriate individuals are notified as to status of opening and closing.

Appendix

SUBJECT AREA: Professional
Improvement

- TASK # L210:** Be familiar with various professional and trade associations and make decisions about membership in these organizations.
- COMPETENCY:** Identify and select appropriate professional associations for membership.
- CRITERION MEASURE:**
1. National, state, and local professional and trade associations are correctly identified.
 2. Objective means of accomplishment and membership requirements in each association is determined.
 3. Priorities of needs on an individual basis is determined and membership decisions are made for joining specific associations.
- TASK # L211:** Be aware of how and where to find current information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.
- COMPETENCY:** Locate information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.
- CRITERION MEASURE:**
1. Public agencies who have information, material, services, and personnel available in above-mentioned areas are correctly identified.
 2. Private agencies, organizations, and businesses that have information, material, services, and personnel available in above-mentioned areas are correctly identified.
- TASK # L212:** Have knowledge of and subscribe to various professional and trade publications.
- COMPETENCY:** Identify and subscribe to various professional and trade publications.
- CRITERION MEASURE:**
1. Professional and trade publications are correctly identified.
 2. The type of information found in professional and trade publications is listed.
 3. Procedures for subscribing to professional and trade publications are listed.

APPENDIX E

SUGGESTED EQUIPMENT

RECREATIONAL GROUNDS MANAGEMENT TECHNOLOGY

24 Students

<u>Quantity</u>	<u>Description</u>
1	Mechanics tool set complete with cabinets and all hand tools The following items may be in the mechanics tool set. However, the institution may need to order additional sets or single items such as a specific size wrench. Exact specifications are not given herewith, such as 1/4" wrench but are given in sets.
2	Ball peen hammer, various sizes
1	Mechanics hammer
2	Plastic tip hammer
2	Adjustable wrenches, various sizes
2	Wrenches, box end. Metric and/or SAE set complete
2	Wrenches, open end, set SAE and/or metric
2	Wrenches, combination sets metric and/or SAE
1	Wrenches, specialized set. Small engine
2	Wrenches, racheting box ends
2	Wrenches, socket sets complete with extension and all drives, SAE and metric in all sizes and drives. Deep sockets. Prices may range from \$9.00 for 1/4" drive to \$98.00 for 3/4" drive.
2	Cold chisels, sets
1	Punches, sets
1	Pry bar
1	Wedge bar
2	Mallet, rubber

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<u>Quantity</u>	<u>Description</u>
6	Screwdrivers, sets, standard and Phillips
1	Screwdrivers, specialty types
4	Pliers, all types and sizes
2	Setscrew wrenches
2	Wrenches, torque dial and micro adjusting types
2	Tap and die sets. Metric and SAE
1	Hack saw
1	Sets, ball joint sockets
2	Hammer, brass
2	Oil filter removal wrench
2	Pliers, hose clamp
1	Valve adjustment tool
1	Gasket scraper
1	Electric drills, $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ "
4	Work benches
1	Tool stand
1	Grinder, electric with pedestal
2	Oil pressure can
2	Grease gun, hand-type
1	Steam cleaner
2	Oily waste cans
1	Oil can opener
1	50-foot heavy duty water hose, complete with nozzle
2	Extension cords, heavy duty, various lengths
1	Thread gauge set

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<u>Quantity</u>	<u>Description</u>
1	Battery filler plastic, 2 quart capacity
1	Drain pan round with pouring spout
1	Drain tank with pouring spout
2	Oil can
1	Belt tension tool
1	Piston pin inserter set
1	Piston ring groove cleaner
1	Valve lifter remover
2	40' electric cord reel
2	Set booster cables, heavy duty
1	Spark plug cleaner and tester
1	Rivet set
2	Gas can, 5-gallon capacity double seamed reversible spout
6	Small gasoline engines, various types and sizes
2	Snips - various types
1	Drill bits, set
1	Turf truckster
1	Tee and fringe reel mower
1	Triplex greens mower, riding
1	PTO sprayer with hose and boom assembly
1	Topdresser
1	22" self-propelled greens mower
1	Sodcutter
1	Verticutter, self-propelled
1	Blower or sweeper

Appendix

<u>Quantity</u>	<u>Description</u>
1	Vehicular-drawn cyclone spreader
1	Lawnmower and reel grinder
1	Bedknife grinder
2	Drop spreader
1	Commercial rotary tiller
2	Wheel barrow
1	Bench grinder
1	Lapping machine
1	Automatic irrigation system components
1	Table vice
1	Greens aerator
1	Vertical mower set
1	1-gang mowing unit
1	Soil shredder
1	Drag mat
1	Commercial-type rotary mower
1	Tractor and equipment, lease complete
1	Yolk rake
1	Trailer
1	Riding Sand Trap Rake
1	Pick-up truck
1	Power trap edger
2	Cup setters
1	Divot repairer

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Appendix

<u>Quantity</u>	<u>Description</u>
6	Sparkplug socket 13/16
2	Pipe cutter 1" - 4"
2	Spark plug gap gauge
3	Point gap gauge
8	Shovels - round point
2	Shovels - flat point
1	Spade
1	1½-ton mobile hydraulic jack
4	Axle stands
1	Battery charger
2	Soil rake
2	Hatchet
2	Claw hammers
1	Heavy-duty hammer
1	Hub clamp
1	Spring compressor
1	Allen wrench set with case, .05 - 3/8
1	Allen wrench set with case, .05 - 1/4
1	Fly wheel holder with case
1	Portable air tank
3	Sprayer - hand
1	Scales
2	Cyclone spreader
1	Commercial Rotary Mower
1	PTO or self-propelled seeder

APPENDIX F

DEFINITION OF TERMS

For the purpose of clarifying the meanings of specific terms in this project, the following words are defined:

Articulation - interrelation of different levels of education for ensuring continuous advancement in learning.

Associate in Applied Science Degree - the award given for the successful completion of a technical education curriculum.

Competency - sufficient judgement, skill, and knowledge to perform a particular task.

Competency-Based Education - the educational process that specifies learning goals in measurable terms and requires that the learner achieve observable behavior changes in knowledge, skill, and/or attitude to demonstrate competency before proceeding to more complex goals.

Competency-Based Instruction - the sequencing and modularization of curriculum into small, manageable units of instruction. The key concept is the student's ability to perform on each segment of the curriculum.

Curriculum - a course or group of courses organized in a logical sequence to meet occupational educational goals.

Curriculum Advisory Committee - a group of local representatives including employees, employers, secondary and postsecondary educators who counsel and advise the institutions regarding the improvement of occupational programs, in an effort to more adequately meet the needs of the community.

Educators - refer to individuals employed in educational institutions and in local, state, or federal agencies, both secondary and postsecondary.

Job Analysis - a detailed listing of tasks currently being performed by workers in a clearly defined, specific job.

Learning Experience - an activity planned by educational institutions whereby the student can practice behavior implied by the objectives.

Occupational Survey - a procedure using mail questionnaires and/or personal interviews to gain knowledge of a community, educational interests or occupational needs to assist in planning.

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Skill - the ability to use one's knowledge effectively and readily in execution or performance--dexterity or coordination in the execution of learned physical or mental tasks.

Task - a logically related set of actions required for the completion of a job objective; also a task may be a complete job element.

Task Analysis - a study to determine the steps a worker must know and the key points of knowledge to know in order to perform a given task.

Technical Programs - consist of occupational-oriented courses and general education courses that lead to the awarding of an Associate in Applied Science Degree and prepare students for jobs in paraprofessional fields.

Vocational Programs - systematic groups of courses or sequences of subjects designed to train students for skilled or semiskilled employment opportunities.